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New information perspectives

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Paul Simon

Information warfare: new battlefields
Kathy Crilley

Fraud and Internet auctions
Charlotte E. Bywell and Charles Oppenheim

Do employers really know what they want? An analysis of job advertisements for information and knowledge managers
Retha M. M. Snyman

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The strange online death and possible rebirth of brand theory and practice

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Like a thief in the night, the Web has progressively undermined the validity of traditional brand theory and practice. Yet few brand owners and marketers appear to be aware of this fundamental shift and continue to treat the medium as if it were just another distribution channel, when in fact the Web demands a complete reappraisal of the brand building, marketing and total business processes.

This paper aims to review traditional brand and marketing theory, to consider its relevance in the global digital age and to suggest necessary changes that brand owners need to manage in order to take advantage of and avoid the dangers inherent within a fast changing environment.

Review of traditional brand and marketing theory

Traditional marketing theory defines a brand as 'a product or service that provides functional benefits and added values that some consumers value sufficiently to buy' [1]. The characteristics of a brand that differentiate it from a mere commodity or product include a sustainable price premium, consistent and transferable values (i.e. from one product type to another), non-price barriers to entry and a definite two-way relationship between the brand owner and the brand's users

This paper will outline that for the majority of brands with an online presence, it is only the last of these characteristics over which brand owners may have a sustainable influence. This necessitates a reappraisal of how to construct a long term return-to-brand.

Traditional theory has also considered the tools with which brand owners may manipulate the level of demand for their brands. These were originally confined to the four ('hard') elements of the marketing mix – Price, Product, Place and Promotion. Subsequently, some brand theorists have added a subsidiary three – People, Physical evidence and Process management to complete the canon.

The underlying premise behind the theory remains one of the brand owner maximising direct control over these elements to produce a resultant level of demand from the target audience. In an article entitled *Branding tall*, Scott Kirsner characterises the practice arising from this as 'crafting a careful image that potential buyers then *passively* consume [my italics]' [2]. Brand development, including the perception of value added, remains solely or largely within the gift of the brand owner.

The growth of the Web would appear to have done little to dissuade marketers of the essential validity of this approach. Pallas Learning, a US based training company, are currently promoting a course on building a brand online with the nostrum 'learn the basic principles of branding and apply these principles to your site' [3]. A recent, anonymous, article in the *New Zealand Herald* commented that what brands needed before extending themselves online was 'a little bit of old-fashioned marketing wisdom' [4].

Challenge to traditional theory from the Web

Yet old-fashioned marketing wisdom is being made redundant by the essential nature of the Web. The Web essentially blurs the division between brand owner and brand customer. Online we are all brand owners.

The surfeit of choice online produces a concomitant change in consumer attitudes moving them from 'receptive space' to 'sceptical space'. Greater access to comparative information allows consumers to more effectively question, test and probe a brand's own propositions. Macro changes involving improved incomes and the greater thirst for information and insight suggests that we are globally, and not just via the Web, moving into sceptical space.

This becomes more readily apparent if we take each of the four hard elements of the marketing mix in turn and consider their current relevance

Product

At first sight, it would appear axiomatic that the brand owner controls their own online products (their websites). Yet the technology and flexibility offered by the Web frequently loosens such control That may be via practices of doubtful legality such as deep linking or framing or by community publishing opportunities on chartrooms or bulletin boards. Most reputable websites offering community publishing facilities have experienced the impact of concerted campaigns by special interest groups, whose values may be in opposition to that of the host brand Unless subject to the most intensive editing process these editorial efforts can deliberately, or inadvertently, undermine or redefine the brand values of the wider business for a particular audience segment. This is especially true of younger age groups who increasingly have their first 'encounter' with a brand online with no fixed bearings as to that brand's wider authority or positioning

A failure to establish the desired relationship with a core audience online can very speedily compromise any wider relationship with a brand. Martin Lindstrom, writing in connection with the online strategies of global giants Pepsi and Coca-Cola, stated that 'so many brands fell into the hype trap by grasping the online lifeline and promising their customers all the 'usual' services they offered offline' [5] Customers in sceptical space actually demand far more, because they know far more, and when they feel they are underserved use the Web as a highly effective complaints board that does not allow brand owners to confine bad news to one discrete market (e.g. Boo com)!

Pricing

Web audiences have proven to be highly resistant to allowing brand owners to fix sustainable price points for content or other services, with the exception of a handful of trade or niche offerings. Without being able to develop a price premium for their brand, traditional brand theory fails. Equally, retail brands that offer a discount for web purchases against their other channels risk confusing the market and undermining the longer term positioning of their brand equity.

Place

By its nature a website is a destination of equal accessibility regardless of an audience's location, gender or age. Of course there are filters such as language or in limited cases subscription, but just because a site may aim to target lucrative Audience A, there is little it can do if less lucrative Audience B uses it in droves These 'wasted' audiences are frequently perceived as a problem for brand owners since they are unlikely to provide an immediate source of advertising and related revenues Frequently, therefore, they are dismissed as a cost of doing business as opposed to a new business opportunity.

Promotion

Through the myriad advertising mechanisms available online (including banners, sponsorship, e-mail advertising), the brand owner maintains a certain amount of control, although even here that is lessening through the site scraping activities of search engines and directories and the legal or illegal aggregation and syndication of brand and content by third parties.

In short, it would appear that the Web has made, or is in the process of making, the theory and tools of traditional brand building increasingly obsolete

Requirements for change

Brand owners can respond in two ways to this changing brand and marketing paradigm. Firstly, they can maintain the existing culture and approach and risk their business being commoditised as sceptical space spills out of the Web into the mainstream. Secondly, they can view the Web as a precursor to a wider change in the relationship between brands and their audiences and hence start to adapt both external marketing theory and practice, but also to re-engineer their company's processes, structures and crucially its culture to make it better placed to adapt and sustain, albeit on a different basis, a return-to-brand.

The latter approach demands a series of interlocking shifts, namely:

From:	To.
'Hard' elements of marketing mix/high level of direct control	'Soft' elements of marketing mix/lower level of direct control
Specialist brand guardians	Total brand culture
National market perspective with limited segmentation	International market perspective with limited segmentation

'Hard' to 'soft' marketing mixes

The Web has empowered the consumer with more choice and freedom of action than any other comparable media platform. In sceptical space, consumers have realised their power against traditional brand claims and methods of marketing and demand to be part of the experience, as opposed to being merely the passive receivers of that experience. In driving traditional brand theory and practice close to obsolescence the sceptical space race will force brand owners to focus upon the softer elements of the marketing mix. This may be less so of Physical evidence (although the enormous popularity of Napster suggests that potential consumers of goods will demand sampling as part of their personal buying cycles), but very much so of People and Process management. This in turn necessitates a more interactive and listening posture on behalf of brand owners to ensure that these two 'Ps' are sustainable and profitable.

This requires brand owners to develop a more consistent and equal dialogue with their audiences – i.e. (external) People (customers) and the ways in which the product or service is distributed and experienced (Process management) that changes the traditional relationship Gerry McGovern recognised this when she posited the question:

> If the Internet stands for information and interactivity, instead of image and packaging, will it in time change the nature of what we mean by a brand [6]?

Dwight Gibbs, of Motley Fool, believes that there will be a closer association between brands and individuals online:

> The brand will be everything and individuals are going to start branding themselves [7].

Again, in sceptical space, all involved in a brand become 'owners' of that brand, demanding a 'big tent' and inclusive approach to brand building.

Rolf Jensen in *The dream society* recognised this when he claimed that the successful brands of tomorrow will be those who will be able to build a successful business on developing a shared narrative or exploration with consumers

> That in itself is a great challenge, because stories need development over several years through a dialogue with customers [8].

This is not merely a resource issue, but rather demands a shift from brands to viewing audiences as both co-owners *and* consumers, as brand advocates who can be trusted with a narrative, whether good or ill, and not just the passive recipients of old.

Hewlett Packard is a company that appears to have realised the implications of this shift having developed a new strategy for its printer product range It is using the Web to improve its dialogue with both resellers (intermediate customers) through its 'AisleOnline' programme of local portals and (end) customers through its narrative that printers far from being just 'ethered to PCs' are part of the brand's broader information offering into which it looks to its customers to advise upon their emergent needs.

'We are all brand guardians now!' – from brand specialists to total brand culture

The need for an honest narrative in sceptical space equally demands a greater focus upon the value of internal people – i e employees – in enhancing and deepening that brand experience for all Incredibly, many commentators still shy away from the structural and process implications of this. For example, Allen Adamson, managing director of brand consultancy Landor & Associates, has recently said:

> You need brand evangelists, a chief marketing officer or a CEO who says 'I am the brand champion around the world' [9].

This 'guild' model is unlikely to be robust enough in sceptical space. What is needed is a wholesale company-wide shift away from a few brand guardians to a total brand culture, where everyone from the chief executive officer to the newest trainee are totally focused on providing a consistent narrative and customer-obsessed service to the audience Formal brand owners will need to ensure that their brand values are most effectively communicated via the customer service ethos and function, which is organisationally given as much importance (including board level presence) as the production and distribution functions. As Steve Silver, executive vice-president of direct marketing company Wunderman Cato and Johnson, notes:

> with the move to digital there's an increasing need to focus on the customer and it requires that you manage the business organization differently [9].

Steven F. Edwards, vice-president of Wirestone (an interactive services company), shows how the Web has become the catalyst for this total brand culture. Pithily terming the two once separate disciplines of brand guardians/marketers and technologists as Brandzillas and Code Warriors, he shows how the demands of the Web have created a 'deeper, more complete end-to-end customer experience before, during and after the purchase' [10]

In the UK, the drive towards a 'free' isp culture has not destroyed the business viability of paid for providers, such as Demon or Primex, whose return is based upon the promise of a willingness to genuine dialogue with and listening to customer needs, a shared set of values and high levels of customer service.

'Go global young man' – international market perspectives

Brands have the opportunity to use the global reach of the Web to develop meaningful and profitable relationships with far broader audiences than previously. To grasp this opportunity requires that a brand owner's maxim becomes one of 'we are an international marketing company' and move away from splitting up the domestic and non-domestic marketing functions.

Even hitherto national specific public sector brands such as, for example, the UK's National Health Service (NHS) needs to be aware that its brand values are open to a wider insight and scrutiny, which may influence its longer-term opportunities. Taking the NHS as an example it is not inconceivable that, in the current liberal economic climate, a freer market may develop in the provision of public health care, presenting the NHS with both threats in its home market and opportunities in other markets. This may not be as far-fetched as it may sound, since there is already an increasingly global market in the provision of other public goods such as water and electricity. The NHS, whether it likes it or not, is a global brand with a series of direct and indirect relationships as a result of its web presence.

The national focus of online brand owner structures is not confined to the public sector. Nicola Cowan, in a report into UK national newspaper brands and their respective online strategies, shows most are obsessed solely through extracting short term value from their sister brands' home market with:

> the emphasis given to a local strategy (national or regional) rather than trying to compete on a global level [11, p. 198].

Those brand owners who develop (slightly) different products under the same brand umbrella, extolling the same brand values within different contexts with different customers, are likely to be the success stories of the future. Indeed, Cowan's report suggested that virtually alone of the UK newspaper brands, the *Financial Times* was successfully using the

Web to enhance its strategy of converting the overall *FT* brand from a national into a global experience

Recommendations for further study

This paper has attempted to chronicle the challenges to brand theory and practice and the positive responses to it that brand owners must take in order to thrive and ensure a return-to-brand in the longer term.

Further detailed research would be valuable, amongst others, in the following areas:

- the pre-requisites for brand owners to take advantage of the 'big tent' approach to brand building;
- an analysis of the comparative readiness of companies by market sector to re-engineer their structures, processes and businesses to take advantage of the growth of sceptical space;
- an analysis of the information needs for companies looking to move towards a total brand culture.

Conclusions

It is clear that traditional brand theory and much of the brand building practice of the last 50 years is being undermined by the Web as the clearest expression of sceptical space.

The increasing empowerment of consumers will challenge brand owners to revise their return-to-brand strategies, necessitating a more interactive and collaborative approach to customers as brand co-owners and a re-eng neering of businesses to better express an deliver an internationally aware, total bran culture.

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Information warfare: new battlefields Terrorists, propaganda and the Internet

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Examines the use of the Internet by terrorists, extremists and activists. Analyses the methods employed by these various ideological groups and considers the advantages of using the Internet over traditional publishing and communication methods

Historically, extremists have used media of all kinds as vehicles of propaganda, and have exploited new forms of communication over the years to put forward their views. Online extremism in the Internet age, perhaps was just a matter of course. Whatever the organisation, using the Internet has overcome the limitations of traditional publishing, offering a quick, inexpensive, and anonymous means of communication, and ideological information is reaching new audiences around the world. New threats of the twenty-first century come from the extreme right wing environmentalists, neo-nazis, animal rights groups and criminals who can exploit the technology and structure of the Internet.

The term information warfare can mean the use of smart technology in a traditional war or the use of IT systems attacking part of a country's infrastructure. The common fear appears to be the vulnerability of the latter. In some cases it appears that national laws cannot stem the tide of these emerging groups and governments are responding to this new threat with draconian measures by introducing electronic surveillance and interception to combat the increasing use of encryption favoured by terrorists and criminals alike. Governments have to strike a balance between freedom of speech on the one hand and the security of a country and its people on the other

Introduction

Traditionally propaganda has been disseminated by word of mouth or printed pamphlets distributed through a known network of members and sympathisers. The Internet, however, has made information widely available to a more diverse audience than ever before and offers many advantages over the 'traditional' methods of publishing: it is relatively cheap in terms of presentation, set up and distribution, plus it has the ability to bypass national laws. The national security consequences of the potential use of the Internet by terrorist organisations are now a concern of governments, police and intelligence agencies.

Scope and definitions

The research period of this study was July 1999 to October 2000 and was restricted to open source information available in the public domain, focused mostly on the United Kingdom, although significant material from other countries was incorporated

Definitions

Organisations once stated publicly who they were and what they stood for, but now terrorists call themselves (urban) guerrillas, freedom fighters, or liberation armies, and are just as likely to be an individual, a country or government. To some, an extremist is one and the same as a terrorist, or a violent international criminal gang, a political organisation or a religious faction that espouses violence, or an activist with 'extreme' views.

In the UK, the Terrorism Act 2000 defines terrorism as:

> the use or threat designed to influence the government or to intimidate the public or a section of the public, and that use or threat is made for the purpose of advancing a political, religious or ideological cause.

Importantly, 'action' involves:

> serious violence against a person, serious damage to property, endangers a person's life, creates a serious risk to the health or safety of the public or a section of the public, or is designed seriously to interfere with or seriously to disrupt an electronic system [1]

Despite the number of attempts to define terrorism and terrorist, there is no uniform international definition agreed on. Perhaps this is inevitable as one man's terrorist is often another man's freedom fighter Of course, it can be argued that if the outcome is the same, what difference does a label make?

Information warfare (IW) has been defined in several ways, but the general consensus appears that the possibility exists where adversaries might exploit the tools and techniques of the information revolution To qualify as cyber-terrorism, Denning suggests that any attack should 'have an element of fear somewhere in the equation' [2].

National Critical Infrastructures (NCI) are systems whose incapacity or (threat of) destruction would have a debilitating impact on the defence or economic security of the nation. They include electricity power systems, gas and oil, telecommunications, banking and finance, transportation, water supply systems, government services and the emergency services [3]

Literature review

The view in *Extremism and the Internet* [4], is that extremism should be defined by an individual or group's willingness to promote their cause by violence and by the denial of fundamental human rights to others. This report concentrates on extremists rather than mainstream terrorist and Islamic fundamentalist groups. The website Combat-online: terrorism puts 'extremist religious groups' firmly in the category of 'terrorist organisations', whilst the editors of *Extremist Groups* [5], believe that terms such as 'guerrilla', 'rebel', 'terrorist' and 'freedom fighter' create more controversy than clarification.

The United States has taken a lead in recognising the threat of cyber terrorism and an open government policy has meant that many (unclassified) documents are available on the Internet. Many research institutes such as The Terrorism Research Center [6] and Infowar.com. [7] have followed, publishing a wealth of material online Whilst in Germany, the Office for the Protection of the Constitution (BfV) actively studies right-wing extremist Internet activities and publishes an annual report in German with a summarised English version [8]

Methodology

By definition, terrorism today is not so cut and dried so first an attempt was made to determine what characteristics distinguished a terrorist from an extremist or an activist *Patterns of global terrorism* [9], compiled by the US State Department, provided the list of designated terrorist organisations from which to identify groups with websites. Internet research also revealed material about these organisations, written by journalists, sympathisers, academics, military strategists or government agencies.

The Northern Light search engine alert service automatically tracked websites, according to the search criteria submitted, and the results were returned daily by e-mail Newsgroups and discussion groups, such as www.deja.com and www.cryptome.com, were used to investigate whether terrorist or extremist groups posted any information on these fora

Problems such as no de-duplication of hits, dead links and numerous cross-links occurred, and the different spellings or translations of some terrorist groups posed problems when searching: Kurdistan Workers' Party is also known as the PKK; the Colombian Liberation Army is abbreviated in Spanish to ELN; the Peruvian Tupac Amaru Guerrilla Army is the MRTA, Basque Fatherland and Liberty is ETA, Osama bin Laden is also spelt Usama or Usamah bin Ladin.

Results

Why use the Internet?

The arrival of the Internet has perhaps provided the first forum in history for all the disaffected to gather in one place to exchange views and reinforce prejudices [10]. Coupled with sophisticated web and communications technology, the sheer size of the Internet means that any information or propaganda has the capability of reaching more would-be sympathisers than any rally or pamphlet distribution. The ability to bypass national laws along with electronic mail and networking has created the ideal medium for terrorist, extremist and activist groups alike.

Communications

Electronic mail, and especially Hotmail, is a powerful communications tool. The sender can use any computer with Internet access, enabling anyone constantly on the move to send or receive mail from just about anywhere in the world. It is not so difficult to appreciate just how useful Hotmail can be, especially as Internet Cafes can now be found in many countries The most useful aspect of web-based mail is that it provides a large measure of anonymity as the user can specify password and username of their own choice, making it extremely easy for any terrorist or extremist to hide behind this method of communication Many activist groups instruct would-be members to establish a secure web-based e-mail address, such as HotMail, in a fictional name for security reasons

Web technology

Easy access to the Internet and the technology afforded by web browsers and hypertext provide users with fast links to like-minded groups Websites can be created without any technical knowledge, which means that many groups have embraced the Internet for the dissemination of information regardless of their geographic location. Symbols, too, are powerful communication tools as they convey so much meaning in a single image They are immediately recognisable and highly emotive, and according to ADL, neo-nazis, racist skinheads and white supremacists use a great variety of symbols in their propaganda material to instil a sense of fear and insecurity [11]. Video clips and sound also enhance websites, and it is this slickness of layout and improved quality, coupled with the low cost and high distribution factors which can enable any organisation to attract the kind of sympathiser previously denied to many terrorist or extremist groups National Alliance is considered by ADL to be the single most dangerous organised group in the United States [12], as their website is devoted to the promotion of 'hate core music' and the dissemination of hate literature.

Networking

The Internet has fostered the rise of dispersed network forms of organisation Geographical location is now irrelevant. small and previously isolated groups or individuals can now communicate, collaborate and link up to conduct co-ordinated joint actions as never before, with any prejudices reinforced by like-minded people E-mail and chat can facilitate the interaction between apparent disparate groups. The Scottish Separatist Group (SSG) and the Irish Republican movement liaise with each other over matters of common causes via their website forums Exiled rebels, sympathisers or support bodies host many terrorist or rebel websites well away from the conflict zone. Sendero Luminoso set up their website in 1996 and is maintained by a support group in Berkley, California. Tupac Amaru Revolutionary Movement (MRTA) operated from Europe and its magazine *Voz Rebelde* includes messages of solidarity from leftist groups around the world

Bypassing national laws

An ungoverned Internet owned by no one person is a difficult place to police. Whilst copyright was the first Internet legal issue to be aired, the principle is still that each country has its own national laws, and what is illegal in one country may well be legal in the next This is especially true of those that promote neo-nazism and race hate The American website Stormfront [13], offers German and French racists the medium of publishing Holocaust denial material, nazi symbols and memorabilia prohibited in their own countries. China's first electronic underground magazine aimed to break through 'the lock on information and controls on expression' *The Tunnel Magazine* [14] was sent to a US site and distributed by e-mail back to China. Their inaugural statement says the basis for *Tunnel* is technology: 'the computer network has changed the dissemination of information'.

Source of revenue

In addition to the promotion of their propaganda, terrorist and extremist groups use their websites to raise money by requesting donations or subscriptions. The trend for many white power racists and skinhead groups is to use the Internet to market and sell their music and merchandise, such as flags and banners as well as propaganda speeches in audio or video format. As Whine points out, the Internet reaches the youthful and impressionistic audience extremists most want to reach [15].

Who are the groups?

Whine [16] also suggests that it is the far right extremist (white supremacists and neo-nazis) and radical Islamics who are pre-eminent in using the Internet and their common characteristic is their transnational nature. The right-wing active both in the USA and Europe are seeking to unite Aryans, whilst Islam, spread worldwide, seeks to unite under Muslim rule. These types of organisations make them ideal users of networks and proponents of netwar.

Ideology plays a role in some nationalist movements, but more often than not religious fundamentalism appears to be the motivation; strong religious beliefs and nationalist-separatist goals are an effective combination. At the forefront of this extremism is an international ad hoc coalition of terrorists, unaffiliated with no specific national allegiance but appearing to share a willingness to use serious violence to effect political change As countries tighten security against Islamic terrorist movements, radical groups are increasingly relying upon their international networks to help plan and execute attacks.

However, ideology has not been completely overtaken by the influence of religion as a number of left-wing movements continue to exist, such as the Turkish Revolutionary People's Liberation Party – Front (DHKP-C) and the Peruvian Sendero Luminoso (Shining Path)

Right-wing extremist groups

Historically, extremists have used media of all kinds as vehicles of propaganda. Online extremism is just a matter of course. Amongst the most dynamic of all the political extremes is now the far right with race hate sites on the Internet on the rise Marquand reported that the number of organised hate groups in the US rose 20% during the previous year (1997), and although several factors may be involved, it was also down to the 'promotional savvy of extremist groups on the Internet' [17]. Racist groups, typified in the US by the Klu Klux Klan, in the UK by Combat-18 (C-18) and various skinhead aggregations (the latter especially prevalent in Germany) form the core of the right-wing movement Groups such as the German neo-nazis have been using the Internet to communicate via bulletin boards since the 1980s, listing forthcoming events, contact numbers, and planned co-ordinated action [18] Right-wing extremists have grown exponentially over the past few years, and the German Office for the Protection of the Constitution (BfV) has monitored the use of the Internet by right-wing extremists for a number of years The BfV are aware of at least 300 German websites, 130 European sites, plus 200 in the USA, and of these 80 are anonymous which contain material, which in German law, is criminal. In 1996 there were just two foreign-hosted websites with a total of six German right-wing sites.

Despite the fact that many commercial ISPs in Germany have repeatedly banned websites with right-wing extremist content, these groups have simply set up on their own as service providers (as did the National Democratic Party) and will offer web-hosting facilities to other like-minded groups It appears that groups who operate via a German ISP carefully choose their words so as not to break the law, whilst those who wish to distribute material that is against German law are careful to select a foreign ISP (mainly in the US), such as 'Yoderanium'.

In 1997 AOL closed down the Nationales Info-Telefon site because of its national socialist propaganda and, to avoid censorship, the Heimatseite (Songs for the Family) moved to the Swedish host 'Nordland' The right-wing extremists have begun to organise themselves into 'Freie Kameradshaf' (free associations) with no centralised structure but keep in close contact via the Internet.

The German right-wing skinhead scene is now influenced by organisations such as 'Blood and Honour' (although the German division was banned by the government in September 2000) and 'Hammerskins', mainly by the increasing number of skinhead concerts and the circulation of the *Blood & Honour* magazine CD-ROMs are advertised on their websites and now the popularity of MP3 has meant that skinhead music is also easily downloaded from the Internet

The BfV reports that whilst the right-wing scene is organisationally chaotic and ideologically splintered, the use of the Internet however does give the would-be-leadership of the extreme right wing a focus point and enables them to establish contact with a completely new source of potential recruits or supporters Possibly, say the BfV, the sort of person who would not necessarily accept a leaflet in the street but would take the information anonymously off the Internet, especially as many websites are now well produced with emotive graphics and 'patriotic' music. It is this very anonymity which the extremist organisations rely on. The authorities are well aware that not everyone will be affected but are concerned that young people will fall prey to the propaganda and skinhead music that is on offer.

The use of newsgroups such as 'Survivalism', 'Revisionism' and 'Skinheads' offers a forum for the extremist: and many of the messages are often posted to other newsgroups irrespective of subject matter. Internet Relay Chat channels such as 'White Power' and 'Holocaust 2000' are also used The BfV state that many extremists are increasingly making use of password protected sites and encryption software for sending e-mails in an effort to avoid state monitoring.

Right wing extremism in North America

A report issued in 1999 by the Anti-Defamation League [19], states that racists and extremists are creating an 'electronic community of hate' Groups such as the KKK, neo-nazi skinheads and the National Alliance are prominent groups using the Internet to spread their propaganda, which is extremely useful when such groups are marginalised and outside many social circles Don Black, former director of the Klu Klux Klan, recognised the importance of the Internet

> the potential of the Net for organizations and for movements such as ours is enormous .we're reaching tens of thousands of people who never before have had access to our point of view [20].

Black went on to create 'Stormfront' in 1995, the first major white supremacist website and instrumental in networking extremist groups on the Internet. Stormfront hosts many sites, including the KKK, and has set the template for many other websites with forums, chat rooms, mailing lists, calendar of forthcoming events and an archive of audio and video clips of public addresses, with links to other similar sites and newsgroups such as alt politics nationalism and alt skinheads.

Another Internet pioneer is American white supremacist Louis Beam, using computer bulletin boards since the early 1980s as a means of communication and to circulate literature and information otherwise outlawed by the US and Canadian postal services Beam stated·

> Organs of information distribution such as newsletters, leaflets, computers etc which are widely available to all, keep each person informed of events allowing for a planned response [21]

Today, his Aryan Nations website [22] can now offer material via mailing lists to huge audiences – unheard of even 20 years ago

Right wing extremists in the UK

British far right extremism has achieved less impact than in the US and the rest of Europe. Combat 18 (C18) was born during the early 1990s, created by the BNP to protect its meetings against anti-nazi attacks and a splinter group of the White Wolves Violent factional

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splits have since created the National Socialist Movement, and now C18 itself has split from Blood and Honour Great Britain.

The use of the Internet by racist groups has spawned the development of another type of activist group who use the Internet as a means of counteracting this escalating number of race hate websites. The Anti Defamation League (ADL) [23] is fighting anti-Semitism with guidance to parents, updates on terrorism, civil rights and government affairs. The Nizkor Project (www nizkor org) was set up to respond to the many Holocaust denial websites and publications, Simon Wiesenthal Center calls for ISPs and web publishers to assume greater social responsibility for Internet content.

Direct Action Groups

The most active groups using the Internet in the UK appear to be those involved in animal rights movements. Whilst many animal rights activists may not advocate the use of actual violence, they are not hesitant about resorting to civil disobedience as a means of gaining attention. The movement's extremist fringe believes that economic sabotage is a valid means to achieve its goal of protecting animals from any harm by humans. To this end, activists use a variety of tactics to inflict economic loss designed to put targeted 'offenders' out of business. These tactics involve using the Internet to its full potential as a useful propaganda tool. With the minimal expense of publishing information, along with the potential readership of millions, the Web is the natural place for publishing protests and dissent for anyone with a cause.

For some groups the Web has become another tool among many, and for others the emergence of the Web has created the opportunity to form an effective activist group. Many activist groups owe their very existence (and effectiveness) to the Internet: they have a cause but no financial resources for starting a campaign either by the traditional way of posters, leaflets, meetings, or the know-how to build their own website

The Web as a news source

The Internet has proved a valuable source of breaking news, archival material and as an outlet of 'alternative' new source: methods employed by all types of groups to publish their ideology online and to put over their views in the belief that western media will generally distort or refuse to publish their message As there are no geographic boundaries, news from the Web can create a groundswell of supporters and sympathisers in one country far removed from the area of conflict. The Zapatistas in Mexico, Hizbollah in the Lebanon, and ELN in Colombia were quick to discover the Internet's power in this respect.

Publishing activist magazines on the Internet, sometimes in conjunction with a print version, is also a common use of the Web. It allows a group to publish back issues, more extensive information and breaking news, which would have been financially impossible before the Internet developed.

Both animal rights and militant environmentalists movements publish their newsletters online. *Arkangel*, the British-based organ of animal-rights supporters, and *Earth First!*, journal of the radical environmental movement, each containing information ranging from reports of recent actions, techniques for conducting vandalism and sabotage, addresses of targets (usually doctors, scientists, research laboratories), and news about imprisoned activists Originally hard copy journals, both movements now use the Internet for publicity and communications purposes. *Liberation Magazine* (animal rights), *Final Conflict* (International Third Position) and *Flame On-Line*, are just a few of the online magazines. Some magazines may not belong to a particular ideological group but pull together direct action news and events from various organisations:

- 'SchNews' [24], published by Brighton's Direct Action collective, has news from around the world and a diary of events and archive material.
- 'Urban75' [25] says it is one of the UK's busiest independent sites featuring direct action, rave, and drug info. The Action homepage reports the latest demos, protests and events and the links page is a com-

prehensive activist database – mostly UK groups but does include major US and Canadian activist groups.

- 'Zmag' [26] hosts extensive writings and commentaries from left wing academics and theorists
- 'Nocompromise' is a militant, direct action magazine with news, archives, merchandise and links to other action groups

The Internet has opened up a new virtual worldwide reference library for researchers and general public alike, which could not have been so publicly available pre-Internet The availability of raw data, commentaries, press releases, facts and photographs and the ease of forming these archives make them invaluable. Governments also provide access to official documents, legislation, policy statements and discussions about various issues, and activists can find information on key decision-makers within any government department.

Newsgroups and forums

There are many Internet newsgroups such as alt.animalrights promotion, uk.politics animals and alt activism to provide the networking facilities for the extremists and activists Groups can post protests and propaganda, and as with any type of organisation, discussion, feedback and pledges of support are the lifeblood of many such groups. Messages can be posted to newsgroups not dedicated to extremism or activism, and whilst most are only accessible for a few days, it nevertheless provides these groups with the opportunity to unleash their, often virulent, messages on unsuspecting audiences around the world

Whilst many websites host their own forum, some web-hosting companies may set up the actual forum mechanism and invite websites to join. Bravenet web services hosts the Scottish Separatist Group Forum as well as Ireland's Own, which itself, hosts the websites of the IRA and the Real IRA (amongst others) Whilst the anonymity of newsgroups and forums provides the opportunity for groups and individuals to put forward their views without fear of exposure, terrorists are more likely to use encrypted e-mail and password protected private forums rather than public Newsgroups.

Web protests

Street protests can be both organised and publicised over the Internet and whilst it does alert the authorities to the possible extent and damage this type of protest may produce, it attracts far more individual protesters than by word of mouth or leaflets. Letter writing campaigns have always been an effective method of protest, and these days a website is a good place to organise them from. Pre-written messages of protest are available along with the addresses of individuals, corporations or government departments to post them to. The trend though now is for 'online letter-writing' enabling activists and extremists to distribute protest letters by e-mail to a huge number of target names and addresses, any number of times at a fraction of the cost. The Scottish Separatists Group (SSG) targets various government departments, the police and British embassies with ready-formatted e-mails SHAC mounts many violent campaigns against Huntingdon Life Sciences (HLS) and their website has details of protests, news, background information and archives as well as a link to the names and addresses of both corporate and individual shareholders of HLS. Supporters are actively encouraged to contact the shareholders by 'whatever means necessary' This type of action serves to demonstrate the economic pressure a group can bring to bear when targeting a legitimate company. By threatening investors and employees, HLS has suffered severe economic loss during the last year

A number of large demonstrations have the Internet to thank for their success in terms of turnout and organisation Single-issue groups are now spreading to the business world with many activists protesting about world debt Jubilee 2000 [27], an international movement, have organised and reported on demonstrations at the IMF World Bank meetings in Davos, Seattle and Prague, the organisation of which would have been impossible without the Internet

Again, the Internet has provided the tools to create cost efficient methods of protest, and the ease with which such campaigns can be mounted on the Web, and replicated by other groups makes them more effective.

Hacktivism

'Hacktivism' is another method of online activism, which involves hacking into servers or websites and adding or changing existing pages with their own message. This is an effective but short-term method of activism; nevertheless it does gain a lot of publicity. Hackers and crackers (criminal hacking) have been described as the foot soldiers of the sub-state groups, increasingly coming under the designation of cyber-terrorism [28].

During the Kosovo conflict hackers used the Internet to voice their objection to both NATO and Yugoslavia alike, by disrupting services and taking over the websites. Since October 2000, both Hizbollah and Israel have continuously hacked each other's websites. Again, this type of activity can be achieved well away from the area of conflict. Content-based attacks involve the creation of new electronic content or changing the existing content. Other attacks include e-mail harassment, which may include 'cyber-slander' – spreading falsehoods for the purposes of intimidation.

Denial of Service attacks takes the form of bombarding a site with multiple requests in an attempt to slow down or shut down the server at the host sites. Virtual 'sit-ins' can generate so much traffic that genuine users cannot reach the site. In 1998, activist group 'Electronic Disturbance Theater' launched a DOS attack on the Pentagon, Frankfurt Stock Exchange and Mexican presidential web servers in support of the Zapatista rebels, by repeatedly pressing the 'refresh' button; Zapatistas supporters sent thousands of e-mails shutting down the Mexican government site [29]. More recently, pro-Palestinians worldwide targeted and shut down the Israeli government's main website.

Primers and 'tool kits'

For those who do not know how to create a website, there are sites devoted to help activists get online. NetAction [30] was started in 1997 specifically to promote the Internet as an activist's 'tool' and to link grassroots organisations with their Internet based counterparts. Primers provide guidelines, tips and techniques, free downloads of hacking software an provide links to other 'useful sites' such a Ozymandias Sabotage Handbook [31], Guid to Lock Picking [32] and The Terroris Handbook [33]. United Hackers Associatio has links to the Anarchist Cookbook and Basi Bombs. The www.cultdeadcow.com websit provides a collection of downloadable hacke tools, plus advice on what to do if caugh using them. It is, however, impossible to prov that any activist or extremist 'successes' are result of their website, but at the very least, does seem to play an important role.

Legal issues

The laws governing material on the Internet ar not as clearly defined as those governing prin based material and it appears that legislatio cannot keep pace with the issues of today.

Interception and encryption

The encryption/privacy debate has bee ongoing for the past few years. Privac whether corporate or individual, is fundamental to the concept of electronic commerce an it is this principle versus the fight against th growth of criminal usage of the Internet whic concerns the business world and civil libertie groups. Governments have to ensure there is balance between freedom of speech and th protection of national security and the individual.

The UK Regulatory Investigative Power Act 2000 (RIPA) now regulates the circumstances in which data transmitted electronically can be intercepted, enabling th monitoring of e-mail correspondence withi any business or organisation. By installin 'black boxes' at various ISPs, the security services and police can intercept communications, seize information stored on computers and demand the handing over of encryptio keys, which allow any secure data to be read RIPA has, according to its critics, driven coach and horses through online privac enshrined by the Human Rights Act 1998, wit the added potential to undermine confidenc in the Internet itself.

One argument against interception is that commercially sensitive information may be caught rather than criminal and terrorist activities The powers for issuing warrants are wide and many critics fear that the reasons of 'national security' and 'to protect the economic well-being' of the UK (a statutory requirement of the Security Service) may prove too ambiguous.

The fear that businesses may move out of the UK to avoid even the nominal risk of having the security of their data compromised is quite real, as ISPs such as Clara.net is reported to be re-locating abroad to protect e-mail traffic of its blue-chip companies As a counter-measure to RIPA, Cyber Rights and Cyber Liberties have set up their own website, using Hush Communications' encryption software, to create a secure conduit for UK Internet communications [34].

New Zealand and Japan are also planning similar legislation allowing their security services and police the right to intercept e-mail and faxes [35]. As perhaps one might expect, Russia's FSB is reported to be planning all-encompassing surveillance of Internet communications; according to GlasNet 'there is no concept of privacy anywhere in Russian legislation' [36]

In stark contrast to the UK, Ireland's Electronic Communications Act expressly provides that nothing in the legislation can be construed as requiring the disclosure or enabling the seizure of codes, passwords or cryptographic key pairs.

The fear of 'cyber-attack' is perhaps greatest in America, mainly because of the open nature of their society and freedom of information and speech, which has made it especially vulnerable In 1991, the National Research Council stated:

> We are at risk. America depends on computers – the modern thief can steal more with a computer than with a gun. Tomorrow's terrorist may be able to do more damage with a keyboard than with a bomb

Nevertheless, the US government has come under attack during the past year over *Echelon*, a secret eavesdropping operation for developing the capability to intercept Internet communications. But no matter how much legislation or surveillance technology the US develops for interception, it is the country's First Amendment's protection of free speech that has made the combating of online terrorism and the concept of censorship extremely difficult In Robert v Collins, it was ruled under the First Amendment 'there is no such thing as a false idea However pernicious an opinion may seem, we depend for its correction, not on the conscience of judges and juries, but on the competition of other ideas' [37]

It would appear that the growth of white supremacist groups in the US has lead to a belated recognition that domestic extremism poses as great a threat as a foreign terrorist attack. Whilst at the moment, the use of the Internet appears to be a means to recruit new members, plan campaigns and co-ordinate activities, they have not yet followed the German trend of forming larger groups with a political agenda. According to Dee and Corcoran [38], 'thanks to the Internet, extremist groups are growing in influence and are repackaging their message by downplaying racism and instead, focusing on people's fear'.

The driving force to create some kind of regulated Internet through international co-operation is the development of e-commerce within the European internal market and this can only be achieved through confidence in trading with digital or electronic signatures Member states that wish to pursue a policy of E-Government [39] must ensure that the security of the Internet is not undermined by criminal activities. A regulatory framework is now being developed within the European Union, which is concerned with the rising tide of race hate [40] The European Commission Communication of Harmful and Illegal Content on the Internet concludes that it is still the responsibility of member states to ensure that existing laws apply to the Internet [41].

In Germany, whilst appearing to clamp down on right-wing organisations, certain anomalies apply as Denic, (the central office for issuing Internet addresses) recently approved the website www.adolf-hitler.de but deleted the domain name of www.heil-hitler.de, and the ISP, Strato, still hosts www blitzkrei.de In keeping with other ISPs and domain name registrars, they rely on the public to complain before any action is taken. Whilst these anomalies are allowed to exist, neo-nazis continue to flourish on the Internet.

In order to circumvent French anti-racists laws, like many German extremist groups, French groups have simply registered their websites in the United States or Canada. On 20 November 2000, a Paris court ordered Yahoo! to block all French access to these sites This is a potential watershed ruling as it is the first time an ISP has been ordered to impose national limits to material on the Internet [42]. The consequences of this ruling remain to be seen

For countries where news management is a well-defined art, monitoring Internet content is a challenge. President Jiang Zemin of China, stated, 'the most important thing in running newspapers is to uphold the party and political line' [43]. This principle seems to be carried over to new technology, as an Internet Propaganda Administrative Bureau has been set up to guide and co-ordinate web content Additionally, the Propaganda Department has ordered 'ideological education' to be increased on the Internet

Future trends: the new battlefields

Information warfare appears to have no front line and the potential battlefields are where any networked systems allow access The 'electronic Pearl Harbour' may occur where critical infrastructures are strategically attacked by rogue states or organised terrorists. Hoffman [44] believes the 'new terrorist' may seek out military or government targets, although civilian targets are increasingly the object of the terrorist bombs. Whine [16] reinforces this view, believing that netwar may well be of interest to those engaged in a non-military war and some nation states might consider it an adjunct or an option to military war in the future. Laqueur [45] puts forward the view that the future terrorist is more likely to harbour ethnic grievances and will be harder to distinguish from any other criminal. Ethnic terrorists have more staying power than ideologically motivated ones, since they draw on a larger reservoir of public support And, of course, this large reservoir of public support is bein reached through the Internet

Hacking and cracking continues t demonstrate the insecurity of many goverr ment and commercial systems as more sophisticated viruses shut down websites or brin corporate networks crashing down (as did th Love bug). The lone hacker is also giving wa to a new movement: the hacker collectives where emerging groups such as Hacking fc Girlies which shut down the *New York Time* website, the Internet Liberation Front allegedl breaks into military computers and th Masters of Downloading who hack into the U Department of Defense.

Valeri and Knights [46] argue that information warfare, in fact, may prove to be mor effective in undermining the values of e-commerce and e-government by damaging th users' perception of the trustworthiness of th Internet, rather than by a direct terroris attack on a country's critical infrastructure

In 2000, the CIA stated that foreign nation have now begun to include information wai fare in their military doctrine and are developing strategies and tools to conduc information attacks.

> Just as foreign governments and the military have long emphasised the need to disrupt the flow of information in comba situations, they now stress the power o information warfare when targeted agains civilian infrastructures, particularly thos that could support military strategy [47].

Major General Wang Pufeng, forme Director of the Strategy Department, Academ of Military Science in Beijing, stated 'information warfare will in the near future control th form and future of war', and that 'firepowe superiority depends on information superiority' [48]. The Kosovo conflict was described a the first war on the Internet where governmen and non-government agencies alike used th Internet to disseminate information, spreac propaganda, and where hackers disrupted services on both Yugoslav and NATO sites [49] Similarly, the latest Israeli-Palestinian conflic (October 2000) has given rise to numerou attacks and counter-attacks on the website on both sides. This e-Jihad looks set to continu and grow.

Other potential adversaries are the terrorsts who represent diverse threats, such as cults, neo-nazis, activists and hate groups who recognise that 'cyber-weapons' offer them new, low-cost and easily hidden tools to support their cause. Attacks can be launched remotely or from countries where their actions are not illegal or have no extradition treaties with Western countries. Information warfare can, theoretically, offer the terrorist the possibiity of greater security, operational flexibility and anonymity without the need to expose hemselves to any retaliation.

As communications between members of extremist and activists groups increasingly akes place through Internet based communications, face-to-face communication may decline This could mean that the very strucure of these groups may be affected in ways hat would be hard to anticipate and lead to he development of smaller groups with very specific aims, which because of their size will have less power than the looser and larger more effective groups. The small splintered website may well become lost among the huge amount of large commercial websites advertising and selling over the Internet.

The future of online terrorism or extremism is totally unpredictable· the Internet is forever developing and the use of it for terrorist and extremist purposes will undoubtedly change with it The Web might become the most important tool a group can use, or the terrorist, extremist and activist of the future may disregard the Web as a commercial propaganda tool and find different tools to fight their battles.

Conclusions

The nature of terrorist threats has changed dramatically since the cold war era and the initiative appears to be passing to the extreme right. Other threats are now emerging: non-ideological groups, criminals, environmentalists and animal rights groups, who are all making widespread use of traditional terrorist methods.

The convergence of information and communications technology has offered a new dimension to extremist and terrorist groups – from the widest ever propaganda campaign to the disruption or destruction of a country's network system. Technology previously in the realms of only the military is now being commercially exploited At the same time, computer hardware, laptops, personal organisers, WAP mobiles are now affordable items and this consumer shift has made information systems accessible to a whole raft of groups to whom access may have been previously denied. The result is that any would-be terrorist or extremist can now become a player in national or world events.

Technology itself is shaping much of the activist and political groups of the present and many of the groups that have developed have done so because the Internet has allowed them to. At this point it appears that terrorist and other groups are using the Internet rather than attacking it. Only a handful of the terrorist groups on the US State Department list of designated organisations appear to have websites, which seek only to advance their political ideology The Internet has allowed these groups and individuals, whether terrorist, extremist or activist, the means to propagate their ideology throughout the world at very little cost Organisations may use the Internet to raise funds, disseminate propaganda and misinformation In return, supporters and sympathisers can access documents, read updates on recent activities and forthcoming events, make electronic purchases of a wide variety of goods and share information with other militants through e-mail. The Internet, as a facilitator, has also brought together the lone individual with other like-minded people, the random killer or the young male who does not fit into today's complex world [50]. The criminal hacker with the intent to steal can still undermine a country's economic system and the emergence of hacking collectives is creating a new movement in its own right.

Cyber-terrorism may be an adjunct to conventional warfare where terrorist, extremist, dissident or a government in exile may find the computer and the Internet an effective tool in their campaign for legitimacy. Whilst western governments may fear the targeting of their national infrastructures, the evidence to date is that sub-groups at least use the Internet mainly for propaganda, secure com-using the Internet to download bomb-making instructions to target civilians and the rise of the invisible extremist also bears witness to increasing numbers of race hate, white supremacists and extreme activist sites which can anonymously target their opponents from the safety of a computer. Our dependency on information systems, whether military or civilian, has brought with it much vulnerability and the possibilities for creating chaos are unlimited and open to criminals and terrorists alike to exploit: they are all part of the system. Perhaps it is this vulnerability which we fear.

If terrorism is a state of action, extremism could be said to be a state of mind. No matter hat in the UK extremist groups cover a very wide spectrum, they may soon, especially religious extremists, be classified as terrorists should their activities fall under the definitions laid down in the Terrorism Act 2000 (in force February 2001) Although issue-group activists aim at changing specific policies or practices rather than the whole socio-political system, hey do have the potential for endangering life and a nation's social and economic wellbeing. Terror itself is now a chief tactic of many animal rights activists, using violence with the expressed intent of coercing governments or businesses to act in a certain manner. In the UK some direct action groups are also close to being declared as terrorist organisations under the Terrorist Act 2000 because of the level of violence which surrounds their activities. Groups such as Animal Liberation Front, Justice Department, SHAC and Decadent Action (part organisers of the City of London riots in June 1999) describing themselves as 'champion anarchists', are increasingly using car bombs, letter bombs and arson in their campaigns.

'Don't shoot yet, we're not on prime time'. publicity is an important aim of the terrorist/extremist, and in some cases publicity is the sole aim. Generally, the primary aim of the news media is to inform and, with the heighened competition in news provision, to shock or affect the emotions of the audience in order o gain viewers or readers is what the news providers tend to focus on. The Internet as a news source is being exploited not only by terrorist and extremist groups but also by the news media themselves The increasing use of live audio, Real Player, news streaming and web cams are bringing mainstream media directly to the PC screen The 'CNN effect' has come of age on the Internet.

Nevertheless, the amount of people with access to a television or a newspaper is still possibly proportionally larger than those with Internet access and a website is still useful in providing in-depth and up to date information to the 'already converted' or to those who are aware of the issues, rather than for creating awareness In many cases the Web is just another delivery mechanism for content. People using the Internet will seldom stumble across an activist's or terrorist's website. More often than not it will be found by people actively searching for it, or who have followed links from a similar site.

This study has looked at the various ways in which terrorists, extremists and activists use the Internet. From this we can conclude that the Internet is an effective tool as a news source (current and archival), a communication process (open through public newsgroups or closed through anonymous Hotmail and encrypted e-mails), and as a propaganda machine to put forward ideology, justification for action taken, recruitment and funding. Many groups, regardless of their orientation, have developed innovative methods of using the Internet as an activist's tool, sometimes to great effect and web technology provides the speed and quantity of information, text, audio or video, which can be disseminated at low cost which can hardly be rivalled by any other form of media.

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munications, intelligence gathering and fund management [28]. However, the future could see the increase of trading of computer viruses as well as bullets. Unlike the threats of the cold war, cyber threats can come from almost anywhere and originate from any location and for any purpose. The current conflict in the Middle East is evidence that the Internet is part of a nation's warfare strategy

The absence of Internet protocol, lack of policing, the inability to take effective legal action, and the ability to by-pass national laws, has enabled groups to create the perfect information exchange For dissidents in countries with repressive governments or censored media, the Internet makes an important tool and although authorities can monitor the Internet, it is still one of the safest ways to publish anti-government information.

New battlefields may also involve the courtroom and the legislature as well as a country's information structure. The future may mean that ISPs have to take more responsibility for Internet content, and whilst governments worldwide are looking to wide-ranging legislation in the hope of combating terrorism, they are caught between two seemingly diametric principles – privacy and freedom of information in an open society. The law in most countries imposes relatively few restrictions on what can be published, so what are the options? Today's filtering software may help parents to minimise their children's exposure to extremist content, but this will only prevent its accidental discovery and the ambiguity of the English language is such that innocuous material could be excluded. Whilst in the UK, RIPA 2000 was born to facilitate the interception and encryption of e-mail traffic but, as in many areas of society, legislation seemingly cannot keep pace with the advances of technology and there will always be an element of catch-up Another attractive feature to the terrorists.

This study has concentrated on the advantages of using the Internet, but its use is perhaps not without a few disadvantages. For groups whose very existence is due to the Internet, it may be their only source of communication and this could place them at a disadvantage. Lines of communication can be cut. Whether this is intentional, such as sabotage by opponents, whether by legitimate governments or rival groups, or unintentional due to some technical problem or accident affecting telecommunication cables.

Openly published ideological tracts or notices of forthcoming protests means tha any online terrorist or extremist public discussion can easily be monitored – much more so than if it was secret or 'underground'. This study has already shown how governments in many countries are introducing monitoring surveillance and interception of Internet content and communications The terrorist website may be easier to infiltrate than the movement itself.

The lack of structure of the Internet means that it is unmediated with accuracy and validation sometimes hard to prove. This too can present dangers for groups and individuals who may place a heavy reliance on the Internet for current news and events. In many instances the fact that there is no way of confirming the validity of information accessed over the Internet also shapes the ways in which it is used Shenk [51] believes that the Internet wil flood people with so much information and mis-information that it will become impossible to sort through the good from the bad, and the truth from the lie.

Many extremists and activists have also replaced their paper magazines with online magazines. If the website is shut down, wil this lead to a loss of collective or historica memory within the organisation? Will this and the concept of decentralisation and leaderless resistance, in turn lead to a certain amount of instability? Whilst there have been cases where online protests have made their point, ten thousand e-mails does not have the same impact as ten thousand protesters in Whitehall

Research carried out for this study has only touched the surface of identifying the various groups using the Internet Perhaps though, it has revealed the extent of the use of the Internet by extremists and activists groups rather than the 'old style' terrorists, and the problems that now face governments and Internet content providers worldwide. Worrying trends of neo-nazism, the lone wol

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Fraud on Internet auctions

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Research was undertaken to assess the level of fraud and precautions against fraud in Internet auctions A trial run was also carried out by placing items for auction with eBay and then bidding for them.

It is concluded that Internet auctions are severely disadvantaged in comparison to traditional auctions because of their inability to check the quality or provenance of items on offer. The attempts by Internet auction houses to prevent potential fraud have loopholes and can therefore be manipulated by the unscrupulous. The current checks Internet auction houses impose are therefore not enough to eradicate this growing problem. Recommendations are made to a number of different stakeholders, such as the government and the auction industry.

Introduction

In 1995 the first Internet auctions, as they have come to be known, were set up The first such auction houses were Onsale and eBay. Onsale was bought out a number of years ago and eventually incorporated into egghead auctions. eBay, on the other hand, is quite possibly the world's best-known Internet auction house and is still growing.

The success of eBay encouraged others to enter into the online auctions market. Until recently Qxl (formerly quixell), established in September 1997, was the strongest competitor to eBay this side of the Atlantic. However, perhaps due to mounting pressure to diversify, eBay launched ebay.co.uk and ebay.co.de. Qxl's share price fell from a high of 744.5p in March 2000 to approximately 50p in August 2000 and to half that at the end of 2000 [1]. In May 2001 it languished at about 6p.

The process of conducting auctions on the Internet is not entirely dissimilar to that of traditional auctions. An item is still put up for sale and is bid for by those who wish to acquire it. There are, however, a number of key differences between the two processes and these raise some important issues

Firstly, whereas the auctioning of a lot in a traditional auction would be completed in perhaps an hour, Internet auction sites hold auctions for sometimes up to 10 days. This in itself is ironic when the Internet itself is generally seen to be a tool for conducting business rapidly. Secondly, with the traditional process the bidders are (at least in theory) sure that the lot has been examined thoroughly and estimated according to its condition and rarity by trained valuers. Furthermore, the bidders are able to see the item in front of them whilst bidding, and are then able to complete the transaction with the auctioneers and take the item away with them if they are successful.

Internet auctions, however, offer no estimates created by trained personnel in the specific field, no visual contact with the item, other than in some cases an image on the website, and no transaction process enabling the successful bidder to immediately take away their item. However, it is worth noting that the many postal or telephone bidders to traditional auctions suffer the same disadvantages of no direct viewing and the inability to take their purchase away with them immediately. These advantages and disadvantages can be seen more clearly in Table 1.

From Table 1 it can be seen clearly that those participating in Internet auctions are disadvantaged and those present and bidding in traditional auctions are advantaged. The postal or telephone bidders are disadvan-

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Table 1 *Advantages and disadvantages of auctions*

	View an item?	**Take the item immediately?**	**Professionally valued?**	**Fast auction?**
Traditional auction, bidder present	Yes	Yes	Yes	Yes
Traditional auction, postal or telephone bidder	No	No	Yes	Yes
Internet auction	No	No	No	No

taged, as they are not able to view the item or take it immediately. The lack of opportunity to view the item is perhaps of little importance as the item has been checked and estimated accordingly. Trust is put in the auctioneers The absence of a valuation or estimate in Internet auctions means that the value is left at the discretion of the seller This may not be a problem in itself, however, for if the item is valued higher than bidders believe it is worth, the lot will receive few, if any, bids Nonetheless, if this is coupled with the fact that there is no visual interaction for the bidder of the item in question, it leaves bidders in the dark as to what exactly they are bidding for. Indeed they may bid for an item that appears to be reasonably priced, but that is in very poor condition. They may even bid for an item that does not exist.

It could be argued that the main difference between the conduct of traditional auctions and Internet auctions is control, and these two processes lie at opposite ends of the spectrum, with postal bidding in traditional auctions half way between. Traditional auctions leave some processes in the auctioneers' control, such as the suggested price, the lots, the calling of the lots, the bidding and the post sale transactions. These tend to enhance the confidence participants have in those parts of the process that they control, i e. offering items for auction, or bidding for them. Internet auctioneers, however, exercise little control over their auctions. The sellers are asked only to make a few choices, such as the number of days it will run and the minimum bid level, and even within these choices there is little control over what the seller can select. The auction then runs of its own accord until the time period is over.

Perhaps it is this apparent lack of control over the auction process itself that has made Internet auctions so hugely popular in such a short space of time. Perhaps it is the media on which they are conducted, or they even might be part of a new larger trend in information technology. No doubt, all of these must be contributing factors to the appeal of Internet auctions

The Web has meant that people previously unable to investigate areas of interest, perhaps due to their working hours, are now able to browse through the Web at any time of the day. Furthermore, Internet auctions run 24 hours a day. Perhaps it is this ease that makes the Internet auctions currently so appealing. However, the item delivered may not be as valuable as the description implied, or the item paid for may not arrive at all.

The buying, selling and transacting of money over the Internet also raises important security issues and currently this is the problem that all major online auction providers are seeking to alleviate. As yet, there is no worldwide secure process of exchanging money over the Internet. Thus, once the money has left the bidder's account there is little left to rely on apart from trust and the seller's goodwill to complete the bargain.

Fraud and Internet auctions

In America the Internet Fraud Complaint Centre (IFCC), a joint undertaking of the FBI and the Department of Justice, announced that it receives over 1000 complaints a week, all of which originate from online auctions [2]. The IFCC said that the victims lost on average $800 for every fraudulent transaction on Internet auctions reported to them. eBay stated that only one in every 40,000 listings on the sites resulted in a fraud case However, with the listings on eBay growing the odds of encountering fraud, though low, are increasing.

As the number of such fraudulent occurrences has begun to rise the major Internet auctions houses have taken steps to resolve the problems. Firstly, major Internet auctions houses encourage defrauded users in the USA to file complaints with the US Attorney General who then co-operates with the auction houses and the users. However, at the time of writing this article, nothing similar has been set up in the United Kingdom Secondly, eBay has pioneered a useful feedback and rating system that encourages other users to comment and rate sellers according to their behaviour Users are able to comment on any particular seller, and all users before, after or during an auction can access these comments Thirdly, and perhaps most importantly, most online auctions are offering escrow services. These services act as a third party in the auction process and thus oversee the transactions. The bidder, in this case, will send their money to this third party, which will then notify the seller of receipt of the money. The seller will then send the item to this successful bidder and once the bidder receives the item he or she will notify the service of this, which will then release the funds to the seller.

Despite this, the popularity of the auctions grows. Forrester has commented that Internet auction sites comprise over 20% of the top e-commerce sites on the Web [3]. Perhaps it is the sheer number of online auctions that adds credibility. A survey conducted by NFO-Interactive revealed that 10% of online users have participated in Internet auctions, and Jupiter Communications predict that Internet auctions are the business model of the future with business to consumer auctions predicted to move $3.2 billion worth of merchandise by 2002 [3].

Urwin [4] believes that Internet auctions are information solutions for small and medium sized businesses. As the Internet has now changed what was a traditional fixed pricing model, to that of a dynamic pricing model, businesses can now use auctions in a number of ways. The price of goods is now lower on the Internet than anywhere else. Small and medium sized businesses can therefore use Internet auctions to buy cheap items regularly. Similarly, they can use the auctions to sell their goods, or any excess stock they may wish to get rid of, to a larger audience A further use of Internet auctions for businesses may also be to investigate pricing strategies on new products. The company can test a small yet unspecific section of users to gauge their attitude towards the price of their product, reflected in bidding activity.

Fraud can take many forms on the Internet and this article considers just one small aspect. Barrett states that Internet fraud falls into three separate categories: namely the fraud of physical goods, digital goods and published goods or services [5]. However, due to the nature of Internet auctions and the services they offer, fraud on Internet auctions falls into each category.

The reported top three Internet frauds are [6, p 115]:

1. web auctions resulting in fraud (68%);
2. general merchandise sold, but goods never sent (18%);
3. hardware/software which is never sent (3.5%).

Examples of such behaviour include the 'Beanie Baby' fraud where merchandise was sold, but the goods never sent. Two US citizens offered rare beanie babies for sale over the Internet Thirteen people paid sums of up to

$400, but the goods were never received [6, p. 114] Simon Kirkpatrick is an avid collector of antique toys. The first time he used an Internet auction he bid for an old carousel described as 'being in very good condition' When the carousel arrived he found it was in an appalling state Believing that this practice was uncommon, and he was perhaps just unlucky, Simon bid again for a different toy called The Miller, a model man with a sack of flour on his head that climbed a pole. It arrived without the sack and did not work [7]. These are examples of web auctions resulting in fraud Dr Richard Dungu decided to get a new computer monitor using the Internet. He signed up with Yahoo! and with a bid of £125 he won a monitor Richard was then asked to send the money to the seller before receiving the monitor He waited six weeks and with no sign of the monitor he reported to Yahoo!, but the money had already left his account and there was little anybody could do. This was an example of hardware/software that is never sent. Finally, Brian Lurring, just fifteen years old, decided he wanted a laptop computer for Christmas. He bid on the Ebase Five auction and finally won with his bid of £575, all of his savings. The laptop was described as 'a Dell processor, only 8 months old with 12 month warranty' When it arrived it was approximately six years old, manufactured by Compaq with no warranty and thus worth in the region of £100 [8]. This is another example of web auctions resulting in fraud.

What can be done?

The Internet auctioneers accept no responsibility for such losses and advise users to be careful. They do try and carry out the relevant checks that can be seen in all user registration forms such as name, address, e-mail address, telephone number and in some cases credit card number. We will comment on the efficacy of these checks later in this paper.

Escrow companies such as I-Escrow and Escrow com act as a third party or middleman between the buyer and seller [9]. I-Escrow is the service which eBay employs. An escrow service provides not only a safe and secure holding area, but also a reliable method for transfer of funds that ensures peace of mind for both buyer and seller [10, p 65].

All services provided on Internet auctions are basically a variant on this theme. Qxl's service, known as Safe Pay, holds the buyer's credit card payment from the seller until the buyer has received the goods. The buyer then has 96 hours in which to complain about the goods If nothing is heard from the buyer during this period the monies are released to the seller [11] There are, of course, charges for the use of such services. Qxl currently charges £6 99 plus 5% of the final auction price eBay charges £1 25 as an insertion fee plus a percentage of the final auction price

Another option is to go to court. Six sport memorabilia collectors bought autographed sports memorabilia on eBay, to then later find out that the items were fake. A lawsuit was then filed in the USA against eBay alleging that the site failed to end the auctions of the fake memorabilia and that the site, as the largest operator, has a responsibility to ensure the authenticity of the memorabilia sold on its site [12] In October 2000, a Californian Judge allowed the lawsuit to proceed. This essentially strikes a core at the way eBay conducts its business eBay counteract such allegations by stating that it only provides a venue for sales and is not in fact an auctioneer since it does not control the listing of items, the descriptions of them, the price and that it does not hold any of the items

The case is being watched very closely for a number of reasons. Firstly, while in America there are laws intended to protect consumers from fraudulent actions, most of them were written before Internet auctions appeared. Thus, the outcome of this case could set a precedent as to whether online auctions can and should be tried under already existing auction statutes [13]. Secondly, it is believed by some that if eBay loses the case it will stop the Internet auctions in their track and could even spell the end of these companies

eBay's response to the fake memorabilia was to form alliances with a number of organisations specialising in authenticating merchandise It introduced a policy in July 2000 This requires sellers to provide a certificate of authenticity as well as a declaration of the source of the certificate [12].

According to eBay, complaints only number 200 per million transactions. Most of these, it claims, users normally sort out amongst themselves, with officially reported cases of fraud only numbering 30 per million transactions (0.003%) [10, p 63]. Internet auctioneers do recognise that, as the number of auctions increases, the number of problem transactions are bound to increase eBay stated its goal is to reduce the number of problem transactions, and to this end it works along side law enforcement and its content owners to try and identify and eradicate fraud. Jodie Bernstein, Director of the Federal Trade Commission's Bureau of Consumer Protection, acknowledged that in the fight against Internet auction fraud it had productive meetings with the auctioneers and that the FTC will be receiving fraud complaints directly from eBay [14].

Although eBay reports low numbers of complaints, the question remains· how many cases actually take place, yet go unreported? Many users may believe that if they complete their part of the transaction, i.e. send the required money and they receive an item that was clearly misrepresented in its description or they get no item at all, there is little anybody can do. Indeed, the National Consumer League (NCL) in America found that complaints about Internet auctions generated five times as many complaints as all other online commerce sites. Furthermore, its Internet Fraud Watch unit (IFW) found that in 1999 87% of online fraud cases involved online auctions In 1999 consumer losses were reported to be $3.2 million with the average consumer loss being $580 and the average consumer losses to auction fraud being $293 [15]. Figures released from the IFW now show online auctions accounting for 78% of the top ten online frauds, with the age range of those affected being between twenty and forty-nine years old. Other online frauds are general merchandise sales at 10%, Internet access services at 3%, work-at-home at 2% and computer equipment/software at 1%. They have also cited that the top method of payment on Internet auctions being a money order (48%), then cheque (32%), cashiers cheque (7%), credit card (6%) and cash (3%) [16].

The model that eBay (and some of its competitors) functions on is based on trust This is done in four ways: user ratings, community, safe harbour and proxy bidding [17]. We describe three of these here. The user ratings system attempts to award good behaviour of users and punishes bad behaviour such as fraudulent, deceptive or other unacceptable behaviour. Once a transaction has been completed, the seller/bidder is then free to pass comments on the other party as to how helpful, how timely, etc., they were. Other users can then read these comments. Safe Harbour consists of a number of initiatives that are aimed at increasing trust and safety for users of the site, including escrow or the option of insurance for eBay users. Proxy bidding is an attempt to counteract shill bidding. Proxy bidding is the facility for users to specify a maximum price they will pay for an item.

However, there are serious flaws to these initiatives. User ratings, although generally very helpful, can be manipulated. There is nothing to stop friends inflating each other's positive ratings as, undoubtedly, with higher ratings comes more business or choices available to them On the other side, there is nothing to stop rivals from giving each other bad feedback ratings in the hope of their expulsion from eBay and thus removing competition.

The first Internet auctions were set up in 1995 and since this time they have experienced massive growth eBay's site has continued to grow at a rate of 12% a month, with $190 million of transactions taking place in July 1999 [18].

In comparison to traditional auctions, Internet auctions are disadvantaged as they offer no valuation service and no visual or physical contact with the item The medium of communication has a powerful effect on truth telling and assumptions about truth telling [17, p. 217] Face-to-face communication establishes a relationship and encourages more moves to establish trust with instant feedback and body language immediately apparent. With no such relationship formed in Internet auctions other forms of trust are essential [19].

However, this trust is often broken. The Internet Fraud Complaint Centre receives over

1000 complaints a week, all of which originate from Internet auctions. The Internet Fraud Watch unit (IFW) found that in 1999 87% of all online fraud cases involved Internet auctions The figure released for 2000 show this as 78%, a small drop but still a massive majority of the complaints [20].

Our research

One of the authors (CO) registered with eBay with the intent of selling his collection of Polish stamps and envelopes. The other author (CEB) then registered on eBay to bid for the collection, therefore gaining a good idea as to the processes from the buyer and seller perspectives We subsequently did the reverse for a second run at an auction, as is described below

The first experiment involved putting the collection to auction without any images and with no specific display position. No bids were made. The second test included a display of images and a prominent place in the eBay gallery. Gallery items are at least 8% more likely to sell [21] The seller has to pay extra for these features.

Images of the collection were taken using a digital camera and then uploaded on to the eBay site. The auction ran for 10 days in March 2001 However, even with the addition of images and the increase in exposure on the site, coupled with the ease of accessing the lot, only one bid was received This bid was from the senior author (CO).

Results

The first test, conducted in December 2000, put CO as the seller. The auction ran for seven days. There were no bids for the item. This could be attributed to the fact that the item was placed amongst hundreds of others in the same category. In fact when browsing through the site in search for the item we could not find it. This was due to the tedious task of trawling through pages and pages of similar items. Even though he had not received any bids a listing fee of £1 25 had to be paid This was settled by credit card.

The second test, conducted in February 2001, included a number of changes. We submitted the lot under CEB's name A number of pictures were taken of the collection and added Finally, the lot was also put in the 'Gallery'. This is where auctions of any specific category receive maximum exposure and space The ease of finding the items was immediately apparent with only a click on the 'Gallery items' tab needed. CO then bid at £1 above the minimum bid price (£200). The original intention was for CEB to set up another e-mail account, register with eBay under a different identity and bid in the auction. This could have been construed as shill bidding This is the illegal practice of driving up prices; for example friends of a seller could be bidding for an item to drive up the price of the item. However, the plan was for CEB to bid at only £200, the exact minimum bid rather than bid above CO's bid of £201. However, by now the minimum bid had risen from £200 to £205. Once a bid has been made for an item eBay automatically drives the price up by changing the minimum acceptable bid on the website. CEB could only now bid £205, not the planned £200, but this would be shill bidding so we did not take this idea further.

We noted some further flaws. eBay recommends using pictures in auctions and the first two are free to put on to the site. However, who is to say that these pictures on the auction site are genuine? Sellers may well use unrepresentative images.

We were unable to place the items in eBay's 'featured' category To do this a seller must have a user rating of over 10 If a new seller cannot place lots in the categories with most exposure (8% more chance of selling) [22], how can (s)he build up his/her ratings? Such limitations are likely to encourage dubious behaviour.

We found when setting up a new e-mail account with hotmail that we were only asked a small number of identification questions – just name, country and date of birth. They did not ask for any record of address. We created a false identity Having gained a new e-mail account we then registered with eBay, listing the address as the same street, in the same town but with a different house number eBay accepted the new client details. We could (but chose not to) have then bid, or indeed offered items for auction with eBay without any problem. For settlement of accounts eBay asks for credit card details or a cheque in the post, which is also a little naïve

Conclusions and recommendations

The attempts made by eBay to address fraud issues appear to us to be flawed Escrow services and insurance are not compulsory Furthermore, the escrow service was only available in US dollars rather than in pounds. Proxy bidding is also seriously flawed. The seller is allowed to place the first bid on their item to get the auction going. Therefore the seller can drive up the price with the first bid. Furthermore, ratings can be driven up or down by friends or enemies of the seller, so therefore may not be representative. Coupled with this, a member intent on committing a fraudulent act will hold user ratings in little regard. They only need to make one transaction to commit fraud Attempts to prevent shill bidding can also be manipulated and we would argue that eBay's current checks are not enough to safeguard against such practices

Dishonest people exist in the online auction systems, and the current checks are not eradicating them. When the digital hammer falls there is no guarantee it will hit the right person.

Although Internet auction houses have experienced massive growth of late, this growth may suffer unless stringent and effective checks against fraud are put in place. At present, it would be only too easy to bid for an item under a false name and address. Safety procedures put in place by the sites need to be enforced on all transactions, safe guarding users from fraud. These procedures should also be free of charge. Credit card registration should be requested when users first register The record of a valid credit card then safeguards both the users and eBay itself. If fraud did occur the site could then debit the card covering the user's losses and settling eBay's own account. The registration of credit cards at such an early stage may also deter users from committing any fraudulent activities.

The lack of protection for user's of Internet auctions needs to be addressed. As the law stands, there is little cover for people who have become victims to fraudulent activities on Internet auctions. The law is no longer applicable to today's needs and the provision of protection for the growing number of people using Internet auctions needs to be addressed. Implementation of the EU e-commerce Directive will be an important first stage, but further regulation is likely to be needed.

Auction houses must recognise that Internet auctions are a growing phenomenon, and play a part in a large number of people's lives. They must therefore attempt to work in conjunction with them rather then in competition They also need in some cases to enhance their websites to make them easier to search and to allow clients to make bids using the websites.

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Do employers really know what they want? An analysis of job advertisements for information and knowledge managers

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The article is a report of an investigation of the business/practical world's perspective of the role and responsibilities of the information and knowledge manager and the analysis of the findings against a theoretical/academic background Information about employment opportunities and requirements for the position of information and knowledge managers was extracted from job advertisements, which appeared in the three weekly national newspapers with the highest circulation figures in South Africa

The findings revealed that employers seem to have a problem in defining the position and role of the information and knowledge manager in their organisations It also indicated that organisations should be aware of the fact that what they communicate to the public via job advertisements can reflect on their knowledge of information and knowledge management

Introduction

The position of information manager has been defined, developed, redefined, expanded, studied, ridiculed and elevated over the last two decades. Articles have appeared in scholarly literature as well as in the popular press concerning the position and role of the information manager, the knowledge and skills the information manager should possess and the future of the job. Despite these, much confusion exists in the academic/theoretical as well as the business/practical world about who and what the information manager is and what his/her responsibilities are. To further complicate the issue the knowledge manager emerges. Edwards [1, p.29] states that:

> Profiling a knowledge manager can be likened to ancient mariners returning home and trying to describe exotic creatures from far-flung waters They know they are real, but no one else can quite conceive just what they are all about and so they get confined to mythology

Similarly, not too many people have come across a knowledge manager yet A few know they are out there, but when they try to tell you what to look for there is a sneaking feeling that perhaps they do not really exist

The aim of this article is to investigate the business/practical world's perspective of the role and responsibilities of the information and knowledge manager and to analyse these findings against a theoretical/academic background.

Methodology

To achieve the objectives mentioned above, a theoretical/academic background of information and knowledge management was established by studying relevant literature

The business/practical world's perspective of information and knowledge management was extracted from job advertisements for information and knowledge managers which appeared in the three national weekly newspapers with the highest circulation figures in South Africa (as indicated in the *South Africa Yearbook 2000/2001* [2]).These newspapers are *The Sunday Times* (largely English speaking circulation), the *Rapport* (a newspaper largely for Afrikaans speaking people) and the *City Press* (a newspaper largely for Black English readers). Information collected from the beginning of January 2000 to the end of February 2001 is utilised for the purpose of this article. Although librarians, records managers, etc also manage information, only advertisements stating clearly that the position requires an information manager or knowledge manager were included in the study.

For the analysis of the data, content analysis, a data analysis technique applied in qualitative research, was used Content analysis includes working with data, organising it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and reporting the findings. Kaplan (cited in Powell) [3] defines content analysis as 'a research technique for making replicable and valid inferences from data to their context'.

For the purpose of this article the contents of job advertisements for information and knowledge managers were analysed Analysis was done with regard to titles, qualifications, experience, knowledge and skills required, and the duties and responsibilities of the information manager and the knowledge manager.

The findings of the content analysis were studied against the theoretical/academic background obtained during the literature study

Theoretical/academic background

In Bergeron's [4] review, which examined the evolution of Information management from 1986 to 1995, it is clear that two views of information management emerge from the literature. namely the information technology perspective and the integrative perspective. Authors supporting the information technology perspective view information management as an expansion or sub-discipline of management information systems, or as a guide for better management of computer based information systems. This perspective therefore emphasises the technical aspects of information management. Information management is equated with the management and use of information technology. Information resources include computers (hardware and software), management information system personnel, technical staff, etc. In this perspective information management activities include items such as data planning, capacity planning, application selection, information systems development, project management, acquisition of hardware and software, technology and system integration and data administration. In the technology focussed world most of the information staff are actually programmers, network managers and technical support analysts This approach deals mainly with internally produced data

The integrative perspective considers information management as a management approach and function that seeks to integrate and harmonise corporate information sources, services and systems and to create a synergy between external and internal corporate information resources [4] The aim of information management is to establish the necessary mechanisms for an organisation in order to support the organisational objectives Within this context both Boon [5] and Fairer-Wessels [6] see information management as the integrative management of information resources such as information media, people, information systems and physical facilities that are required if information as content is to play a role in enhancing pro-active decision making and problem solving in order to achieve the aims and objectives on personal, operational, organisational and strategic level of the organisation.

With these two perspectives as point of departure two different approaches to knowledge management can be distinguished A gap actually exists between the technological perspective (mainly confined to the business/practical world) and the integrative perspective (confined to the academic/theoretical world) with regard to knowledge management Those with an information technology perspective of information management believe that knowledge management is totally new. The management of both explicit and tacit knowledge is therefore new In their literature overview of knowledge management Ponelis and Fairer-Wessels [7] state that the term 'knowledge management' in the corporate business world is used to refer to the management of content, while the term 'information management' is used to refer to the management of information technology and systems

In the integrative approach to information management only the management of tacit knowledge is new. When considering the five phases of the development of information management over the past 100 years, as identified and described by Marchand and Horton [8], it becomes clear that explicit knowledge has already been managed since the late 19th century in the form of records management. Since then it gradually progressed from records management to the management of corporate information resources, to the management of business-competitor intelligence and to strategic information management

From the literature it is also clear that information equates explicit knowledge Boon [5], for instance, defines information as analysed and structured data with the intention of answering a question. Within the context of this definition information in an organisation can consist of:

- Management information, meaning business and administrative data.
- Internal documents such as correspondence, notes, faxes, minutes, instructions, written procedure(s) in manuals, e-mail correspondence, etc.
- Published information such as books, journals, reports, patents, standards, etc. (including internal publications).

Nonaka [9, p. 27] refers to explicit knowledge as·

> formal and systematic ... it can be easily communicated and shared, in product specifications or a scientific formula or a computer program'

Ponelis and Fairer-Wessels [7] mention that explicit knowledge can be articulated in formal language and transmitted among individuals. Snowden [10] states that explicit knowledge is reusable in a consistent and repeatable manner. It may be stored as a written procedure in a manual or as a process in a computer system Therefore everything documented and outside the mind can be regarded as information or explicit knowledge.

Within this context, knowledge management is not a radically new concept. Duffy (cited in Gordon) [11, p. 22] confirms that.

> Knowledge management is not new or strange. It's simply a refocus on how companies and organisations can use resources to better effect. It's a young discipline but not a new concept.

Explicit knowledge in the form of management information, internal documentation and external publications has already formed part of the integrative management for a long time. The only addition is the management of tacit knowledge.

Nonaka [9] regards tacit knowledge as highly personal It is hard to formalise and therefore difficult to communicate to others. Tacit knowledge is also deeply rooted in action and in an individual's commitment to a specific context (e.g. profession, activities of a team, etc). According to Snowden [10] tacit knowledge is 'something that we simply know, possibly without the possibility to explain'. Human beings are the storage medium of tacit knowledge Willard [12] mentions that the only way to manage this form of knowledge is to ensure that people have the appropriate experience or expertise and are prepared and motivated to apply their knowledge.

An interdependency exists between explicit (information) and tacit knowledge as indicated in Nonaka and Takeuchi's [13] spiral of knowledge. Therefore, knowledge management and information management activities can be expected to correlate Streatfield and Wilson [14] continue by saying that

> Knowledge is not a 'thing' that can be 'managed' directly – we can only manage information about the knowledge possessed by people in organisations.

Knowledge management can therefore be regarded as bringing tacit knowledge to the surface, consolidating it in forms by which it is more widely accessible, and promoting its continuing creation. Knowledge management is an added dimension emphasising the need for the integration of explicit and tacit knowledge. Knowledge management can therefore be defined as a broader term that includes information management. It is the holistic management of information, people and processes with technology as enabler. The task of the knowledge manager therefore includes the identification of knowledge (explicit and tacit) needs and assets and the design, development and implementation of knowledge management strategies and solutions in order to satisfy the needs of the organisation. This can be managed on all levels of the organisation.

According to Snowden [10] 'We have to win the hearts and minds of individuals at all levels.' Streatfield and Wilson [14] feel that all key staff should be treated as knowledge managers, even if one of them assumes overall responsibility for the strategy.

On the theoretical/academic level the literature study has resulted in the clarification of the concepts of information and knowledge management and the interrelationship between the two. It is, however, important to determine how the business/practical world sees information and knowledge management and what the role of information and knowledge managers is in organisations

Business/practical world's view of information and knowledge management

In total 31 advertisements were identified for the possible position of information manager and/or knowledge manager. From the analysis it became clear that a variety of titles exist for the positions. These titles include among others[1]

- Chief Information Officer (3)
- Senior Manager: Corporate Information Management (2)
- Executive Director Knowledge Management and Strategy (1)
- Executive Manager: Information Management (2)
- Executive Manager Information Services (1)
- Director: Research/ Knowledge Management (Afrikaans advertisement: Director: Research/Information Management) (1)
- Chief Director: Resource Management and Information Services (1)
- Chief Director: Communication and Information Management (2)
- Director. Information Management (2)
- Deputy Director: Information Management (IT) (1)
- Assistant Director: Information Management (1)
- Information Services Manager (1)
- Information Manager (2)
- Chief Director: Communication and Information Services (1)
- Knowledge Manager (2)
- Chief Planner: Information Management (1)
- Knowledge Information Manager (1)
- Customer Relationship Knowledge Manager (1)
- Business Information Manager (1)
- Senior Manager: Information Services (1)
- African Renaissance Fund and Information Manager (1)
- Programme and Information Manager (1)
- Finance Information Manager (1)

In most of the advertisements the term information manager or information management appeared in the title. Only six titles referred explicitly to a knowledge manager or knowledge management.

Titles were used haphazardly without taking the real meaning of the title or position into consideration. It also became clear that much confusion exists about the role of the information manager, knowledge manager and information technology manager. In one instance, for example, an advertisement in *The Sunday Times* referred to a *Director Research/Knowledge Management*, while in the Afrikaans version of the same advertisement in *Rapport* the description called for a *Director: Research/Information Management* (Direkteur: Navorsing/Inligtingbestuur). In another advertisement for an *Executive Manager Information Management* the knowledge and skills required referred to 'the ability to develop a strategy for knowledge management and ensure knowledge sharing in the organisation'. In a third instance, the functions and responsibilities for a *Deputy Director: Information Manager (IT)* were typically that of an information manager. In a fourth instance, seemingly to overcome the confusion whether to advertise for an information manager or knowledge manager, the title *Knowledge Information Manager* was used while the job description actually calls for an information technology manager.

Although the title information manager most commonly appears in the advertisements, job descriptions in twenty-five per cent of the cases implied for an information technology manager. In two of the three advertisements that called for a *Chief Information Officer* the job description fits requirements for an information technology manager. See Appendix A for a list of the responsibilities and duties as compiled from the advertisements of an *Information Manager* which would actually be more applicable for an *Information Technology Manager.*

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[1] The number in brackets indicates the occurrence of the specific title description

The titles indicated that information management or knowledge management are also combined with other activities such as. research *(Director: Research/Knowledge Management),* customer relations *(Customer Relationship Knowledge Manager),* fund management *(African Renaissance Fund and Information Management),* and communication management *(Chief Director· Communication and Information Management)*

Although it was not possible to draw watertight divisions between the different levels of information management two levels of positions could be identified· namely positions on strategic/organisational level and positions on operational level. On the corporate strategic/organisational level management activities such as planning, organising, leading, motivating and controlling predominate. On this level the most important responsibility is the optimal management of resources such as people, information systems, sources, services, finance and physical facilities. Appendix B contains a list of the responsibilities and duties of information managers on a strategic/organisational level as indicated in the job advertisements. Thirteen positions were identified on this level.

On the operational level the activities relating to information predominate. This includes functions with direct involvement in information processes. Eighteen positions were identified on this level. A list of the identified responsibilities and duties on this level is included in Appendix C.

A variety of qualifications and experience as well as knowledge and skills were required. No specific qualification in information and knowledge management was, however, required The most common qualification and experience requirement on a strategic level was a tertiary qualification (from a wide variety of disciplines, e.g social sciences, economics, business, finance, etc.) and 3-5 years management experience at senior managerial level. On an operational level an appropriate three-year degree and 2-5 years working experience in information management, or knowledge management, or information technology was required in most of the cases.

Tables 1 and 2 contain a summary of the analysed data with regard to knowledge and skills required for the advertised positions. The information is arranged consecutively diminishing according to the number of appearances of a requirement. From this summary it can be concluded that management skills on a strategic level are of the utmost importance. On an operational level an understanding of information communication technology and computer literacy predominates Good communication skills, interpersonal skills, teamwork skills, project management skills as well as innovation and creativity are important on both levels

Table 1 *Knowledge and skills on a strategic level*

- Strong managerial skills (10)
- Good interpersonal skills (4)
- Good communication skills (4)
- Leadership skills (4)
- Ability to identify and evaluate new technology development and gauge their appropriateness for the organisation. Sound understanding of ICT (4)
- Ability to think creatively and pro-actively (4)
- Project management skills (3)
- Team player (3)
- Problem-solving skills (2)
- Well-developed negotiation skills (1)
- Knowledge of global IM trends (1)

Table 2 *Knowledge and skills on an operational level*

- Understanding of ICT (5)
- Computer literacy (5)
- Project management skills (3)
- Communication skills (3)
- Interpersonal skills (3)
- Team work skills (3)
- Ability to be innovative and creative (3)
- Analytical skills (2)
- Ability to work under pressure (1)
- Ability to work quickly and accurately (1)

As previously stated an interrelationship between explicit and tacit knowledge and the management thereof are vital for success In the advertisements responsibilities and duties indicated often only concentrated on the management of tacit knowledge. See Table 3 for a list of these responsibilities and duties as they appeared in the advertisements.

Table 3 *Responsibilities and duties regarding the management of tacit knowledge*

- Establish a culture of knowledge dissemination and sharing (1)
- Establish a knowledge management system (1)
- Assist in codifying best practices (1)
- Facilitate access to international best practices (1)
- Providing support service to project managers (2)
- Advancing knowledge management within the organisation (1)
- Assist in the development of a learning network (1)
- Assist in the organisation of regular programmes of learning and knowledge sharing (1)

From the findings various conclusions can be drawn as indicated in the following section

Analysis of the findings

The analysis of the advertisements provides an overall picture of the potential employment opportunities in the job market for information and knowledge managers in South Africa between the beginning of January 2000 and the end of February 2001. It gives an indication of the nature and distribution of the jobs. It also identifies the qualifications, knowledge and skills required in order to be successful in the execution of the responsibilities and duties in the various positions.

From the findings it is clear that information and knowledge management plays an important role in organisations It is also clear that the wide spectrum of responsibilities attached to information and knowledge positions causes confusion concerning the true meaning and purpose of information and knowledge management in the business/practical world Job titles are being used haphazardly with little insight into the inherent problems of the field to which these positions refer. Activities of information management are combined with other less related activities such as customer relationship management, research, communication, etc From this it can be concluded that organisations, and the kind of management they need, have not yet properly defined the role of information and knowledge management in their organisations While titles like information manager, chief information officer and knowledge manager appear commonly in job advertisements, as yet few organisations have a clear definition of what knowledge and information mean and what they are seeking to achieve by appointing people to such positions. Although information and knowledge as concepts have become central issues for a number of organisations, the interpretation of the concepts vary considerably from organisation to organisation

The job descriptions (see Appendix B) indicate that some organisations do manage their information sources, services and systems in an integrative way. They try to integrate and harmonise the corporate information sources, services and systems. There is a definite realisation of the interdependence between information systems management and information content management Information technology is seen as an enabler of information management.

But, although the concept of information management is reflected in the titles, some organisations still retain an information technology perspective of information management (see Appendix A) The job descriptions reveal that the emphasis is still on the technical aspects of information management and that the organisations are actually looking for information technology managers. Many organisations still believe that the establishment of an information technology infrastructure will satisfy all their information needs. They do not realise that the value of information technology does not reside in the technology per se, but in the information carried by the technology.

The expectations of employers with regard to the knowledge and skills of information and knowledge managers (as indicated by the requirements for the position) varied considerably according to the type of position. But the most significant finding that emerged was the requirements for interpersonal and communication skills, the ability to think analytically and to work as a member of a team. The question can therefore be raised: to what extent do training programmes provide for the development of these skills?

Although a number of tertiary institutions in South Africa and abroad already offer courses and degrees in the field of information and knowledge management, industry does not seem to be aware of the value of these courses and qualifications. There seems to be a communication gap between training institutions and the practical/business world, which definitely needs bridging. A definite need exists for training institutions to market their courses and qualifications more intensively.

Although there is an awareness of the concept of knowledge management, it has not manifested itself as a profession in South Africa. Despite the fact that 6 out of the 31 advertisements called for a knowledge manager, it was clear that the organisations calling for the appointment of a knowledge manager, in most cases, actually needed an information manager. It seems as if the knowledge manager/management phrase was only used as a catch phrase to attract applicants.

From the analysis of the findings it is clear that most organisations have a restricted view of what knowledge is and what companies must do to exploit it. It can be concluded that only a few organisations understand the true nature of a knowledge creating organisation and the management thereof[2].

Conclusion

This article reviews the findings and analysis of what organisations communicate to the outside world regarding their needs for information and knowledge managers. If this study is used as a gauge of how organisations manage or intend to manage information and knowledge it appears that, although an awareness of effective information and knowledge management in organisations does exist, a comprehensive understanding of the field is lacking and should be improved. It does not exclude the possibility that there are organisations in which information and knowledge are managed effectively. Organisations should, however, be aware of the fact that what they communicate to the public via job advertisements indicates their insight into the knowledge of the subject.

Appendix A

List of the responsibilities and duties of an information technology manager as it appears in advertisements for information managers

- Aligning the information technology function with the organisational strategy.
- Drive and co-ordinate the organisational technology planning process.
- Give strategic guidance to management on all computerised systems and networks.
- Establish and maintain strategic relationships with key IT suppliers and consultants.
- Ensure customer satisfaction by interacting with internal and external clients.
- Provide training for all IT users to ensure productive use of existing and new systems.
- Manage contracts and service-level agreements with outsourcing IT partners.
- Maintain currency of technology know-how.
- Advise the CEO and top management on all IT matters.
- Manage IT infrastructure of the business.
- Implement and manage MIS.
- Strategic input into the formulation of the design and development of technical applications and models.
- Ensure the proper control, maintenance and development of computerised information systems and networks.
- Supervise the IT budget and all IT facilities and support staff.
- Administer various databases.
- Develop Intranet applications.

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[2] Research into the background and expectations of those actually appointed into the positions as advertised, as well as the reality of the jobs, will be conducted as a follow-up to this article

Appendix B

List of the responsibilities and duties of an information manager on a strategic and organisational level as identified in the advertisements for information managers

- Formulate a comprehensive group information management strategy as part of the overall business strategy.
- Align the information strategy with the strategic direction and management plans of the organisation.
- Ensure that the organisation has an efficient and effective information management service to meet the strategic and operational demands of professional and managerial staff at all levels.
- Develop and implement a framework for effective information management support.
- Co-ordinate and monitor the development, implementation and maintenance of integrated information systems
- Ensure that technology is effectively and appropriately used and maintained at all levels.
- Develop, implement and provide support to information technology systems and networks, including maintenance
- Provide technical input for training and development of information management skills
- Investigate the availability of software and evaluate it in the light of organisational needs.
- Plan and support an organisational website.
- Provide and maintain Internet and e-mail services.
- Develop norms and standards for information systems and technology.
- Assist in setting standards in information management.
- Formulate technical standards and monitor adherence by business units.
- Provide mechanisms and monitor quality assurance relating to information technology
- Develop and support management information systems (MIS).
- Management, monitoring and evaluation of information projects.
- Formulate an information policy and co-ordinate strategic direction of information activities.
- Manage communication activities and information services
- Normal managerial responsibilities relating to administration, staff and financial matters.
- Manage flow of information
- Provide accurate advice on information technology.
- Manage all information issues within the organisation.
- Liaise with senior management of all business units on an ongoing basis.
- Manage relationships with external vendors in the information management/information technology fields.
- Give strategic direction of information management and information technology.
- Increase corporate efficiency.
- Sustain professional and efficient resource practices and labour relations

Appendix C

List of the responsibilities and duties of an information manager on an operational level as identified in the advertisements for information managers

- Facilitate improvement of MIS.
- Identify policy information needs and assist in improving current information systems.
- Assist in the development of data warehouses.
- Co-ordinate, maintain and update databases.
- Responsible for datamining
- Compile statistical reports.
- Implement policies on database usage.
- Responsible to deliver product, client and segment based information to users.
- Monitor, validate, analyse and interpret data to provide management information.
- Co-ordinate and process a large volume of online information from a variety of sources to ensure that it reaches the end-user in an attractive and accessible format
- Co-ordinate the production of a newsletter
- Develop, maintain and utilise databases.
- Liaise with other sections of the organisation
- Establish a website.
- Obtain and manage resource information.
- Install networks.
- Create general information systems.

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New information perspectives

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Charles Oppenheim and Joanna Wills

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Should advertising be allowed on JANET?

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Considers one possible strategy for ensuring JANET's continued growth and development, namely to introduce advertising on JANET web pages. Despite this strict policy of no commercial activity on JANET, a few passive advertisements are in fact permitted. Research into the feasibility of advertising was conducted by interviewing and by questionnaire Key players involved in this topic and a number of JANET users were questioned. The best solution to the problem would be to allow Higher education institutions (HEIs) the choice of paying for an advert-free JANET or receiving a free JANET with adverts However, there would probably be more resistance on the part of HEIs to paying for JANET than keeping the service free of charge but containing advertisements. Therefore, it is recommended that advertising be placed on JANET for a trial period. During this period, reactions from users and the HEIs should be gathered.

Introduction

The Joint Academic NETwork (JANET) forms the UK's academic and research network, offering communications services such as electronic discussion lists, news and video-conferencing facilities, as well as advisory and research services Funding for this service comes mainly from the Joint Information Systems Committee (JISC), the body that funds services and developments in information and IT for the UK higher and further education sectors. JANET is managed by a not for profit company, UKERNA (UK Educational and Research Network Association) (UKERNA), which is controlled by the UK higher education funding bodies All UK higher education and research council institutions and many other UK educational establishments are linked to JANET. The usage of the services provided by JANET has grown significantly in recent years. The expenses incurred by running the network have also increased and have put pressures on the budget available for maintenance and growth of JANET. Therefore, new avenues for raising funds need to be explored.

In this paper, we consider one possible strategy, namely to introduce advertising on JANET web pages Adverts, such as those present on Alta Vista and Yahoo! have not, up till now, been implemented on JANET. This is, no doubt, one of the reasons that users (i.e., the higher education institutions and other academic bodies that use JANET) have found the service attractive. The lack of advertisements supports the 'look and feel' of a service created by and for the UK academic community Thus, any introduction of advertising onto JANET would have to be considered very carefully. It would completely alter the user interface and the users' perspective of the network The issues raised by this possibility would apply to any public service network anywhere in the world. This case study therefore has potential not just to inform the UK higher education community, but also any community served by a free at the point of use networked information service.

At the JISC CEI (Committee for Electronic Information) meeting in London, UK, in May 1999, a paper was presented on this topic. It stated:

> The funding bodies have advised the Joint Information Systems Committee (JISC) not to exceed their current expenditure of about £20 million on JANET and generic network services, the remainder is to be raised through network charging Over the past five years network usage on JANET has

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increased from around 500 Gigabytes per month to 25 Terabytes per month, with operational expenditure rising from £9 million to £23 million (funded by the JISC). If this rate of growth continues the cost of operational network provision is predicted at £43 million in 2001. How can this funding best be met (Wiseman, 2000)?

In this paper, we consider the implications of advertising on JANET

Web advertising

One definition of advertising is·

> .non-personal communication of information usually paid for and usually persuasive in nature, about products, services, or ideas by identified sponsors through various media (Marlow, 1997).

Web advertising is advertising found on a website that sells advertising space on the site to generate revenues A site owner may offer to display an advertisement on its web pages, by placing the advert in a box somewhere on the page. Web advertising generates revenues on websites by carrying the messages of other organisations. There is currently great uncertainty about the strengths and weaknesses of the Web as an advertising medium (Schumann and Thorson, 1999).

As Internet popularity has increased, advertisers have begun to show great interest in this new medium. The fastest growing part of the Internet, the World Wide Web, is increasingly being used for commercial purposes by companies who are attracted by the low costs of making information available and the possibilities of reaching a global audience Moreover, the technology for access to the World Wide Web, namely browsers, allow users to distribute and view video and sound as well as text and graphics, and offers interactive possibilities. Online advertising started in 1994 and boomed to a $1.8 billion industry just four years later in 1998 (Zeff and Aronson, 1999) Last year the total online advertising revenue was $8 2 billion (NUA Internet Surveys). Internet advertising has now become an integral part of many companies' advertising strategies

The UK market for web advertising has only recently begun to be taken seriously. Whilst some media professionals are still extremely sceptical about Internet advertising, others claim the future of advertising is interactive aided by improving software, such as flash, and hardware technology. A website provides 24-hour access daily across the world The design of websites is now becoming the province of creative rather than computing employees This in turn is ensuring that the approach to advertising on the Web is becoming very similar to the advertising approach taken on media such as television.

Why advertise on the Web?

The benefits of advertising on the Web can be summarised as follows

It is interactive, and allows fully interactive campaigns and measurement of response

Certain websites with members' details stored either on the organisation's database or by identifying the IP address of the user, or through the use of cookies stored on the user's computer, can access a profile of that member. Using this profile, the advertisement can be tailored, since the advert can be stored in 'layers' The layer accessed is the one that is most appropriate for the user viewing it.

It offers low-cost campaigns

It offers continuous, 24-hour coverage

In contrast, TV advertising offers slots in short (e.g , 15-second) packages However, web adverts only have impact when there is someone connecting to the site and reading the advertisement

It offers precise targeting

This should be compared to a newspaper advertisement, where it is only possible to gauge the type of audience by tracking sales patterns or carrying out detailed research.

Website tracking, through the use of cookies and IP tracking, has allowed Internet marketing companies to accurately track the movement of users on the Web and to see whom is visiting where This allows organisations to effectively target the audience that they are trying to reach. This is in comparison to TV, newspaper and magazine advertising, where adverts appear between programmes or articles, and are viewed by many different groups.

Global audience

The Internet is accessible all over the world This allows the advertising to reach a much wider audience. This can aid in a global marketing strategy if the advertiser has a product or service that is the same all over the world. In any case, the advert can be altered according to the country where the connection is coming from.

Table 1 shows how the value of the UK market for Internet marketing has increased (Zeff and Aronson, 1999).

Table 1 *Value of UK Internet advertising expenditures*

Year	1996	1997	1998	1999	2000	2001
Market Value (£ million)	1.7	3.9	8.2	15.6	26 5	39.8

Current policy on advertising on JANET

At present, there is limited advertising on JANET, and very little revenue is generated from such commercial activity. The JANET policy states:

> JANET may not be used for the transmission of unsolicited commercial or advertising material either to other User Organisations, or to Organisations connected to other networks, save where that material is embedded within, or is other wise part of a service to which the member of the User Organisation has chosen to subscribe (The Acceptable Use Policy).

Despite this strict policy of no commercial activity on JANET, a few passive advertisements are permitted:

- **Acknowledging sponsors** Where organisations and services receive sponsorship from commercial companies, they are allowed to include a small logo or icon relating to the sponsor on their JANET web page. As another option, they can include a link to the sponsor's site, but all the advertising must be passive, in that the user has the choice of clicking on the link or not
- **Advertising services and products** The Acceptable Use Policy allows the user organisations to further their aims and polices. This means that educational and related organisations that have connection to JANET are permitted to post commercial products and services as long as they relate to their purpose. For example, some universities and colleges advertise their courseware, teaching materials and software packages that have been developed by staff or students.
- **Icons on web pages** There are only a few icons on JANET web pages They relate to specific educational services. For example, careers services incorporate links to companies that have graduate job opportunities, and university business departments show partnerships with companies The user has a choice of whether to ignore them, or peruse them if interested

The emphasis, therefore, is on passive advertisement where commercial presence is discrete and the user can choose to follow links if so desired. One concern is that advertising does not in any way create additional traffic on the JANET network.

Our research

We carried out research into this issue by interviewing, or sending questionnaires to, key players involved in this topic, and by sending questionnaires to a number of JANET users. We carried out two in-depth interviews The first was with Norman Wiseman, Head of JISC Programmes, in October 2000 The second was with Diane McDonald, of Strathclyde University, who was at the time (April 2001) carrying out a small JISC-funded research project in the same subject area.

Two questionnaire surveys were also undertaken One was to certain key JANET stakeholders and the other to some JANET users. Although different in detail, each questionnaire explored attitudes to allowing advertisements on JANET and (in the case of the users) whether it would alter their use of the network.

The JANET stakeholders targeted were senior management in.

- UKERNA;
- MIMAS (Manchester Information & Asso-

ciated Services, a JISC-supported national data centre run by Manchester Computing, at the University of Manchester);

- EDINA (Edinburgh Data and Information Access, a JISC-funded national data-centre);
- Universities UK (formerly the better-named Committee of Vice Chancellors and Principals, the body that represents UK vice chancellors);
- JNUG (JANET National User Group, which represents the views and concerns of people who use the national academic network, JANET, to those who are responsible for its funding);
- UCISA (University and Colleges Information Systems Association, which represents the whole of higher education in the provision and development of academic, management and administrative information systems).

Together these represent the key stakeholders with an interest in the provision and use of the JANET network, and the many services connected to it, such as the Distributed National Electronic Resource.

The user group surveyed was not as specifically targeted as the stakeholders were. The questionnaire was sent to all the members of the Loughborough University Information Science Department This included 40 staff (professors, lecturers, research associates, etc.) and 355 students (all undergraduates and the taught postgraduates).

All the questionnaires were sent as e-mail attachments. A copy of both the questionnaires can be obtained from the authors

The JANET user questionnaire

The JANET user questionnaire contained four sections: general information, use of the Internet, use of JANET and advertising on JANET

The core of the questionnaire required the users to score the acceptability of advertisements from certain types of advertisers. The list of advertisers provided in the questionnaire can be seen below. The scale was ranked 1 = Very Appropriate, 2 = Appropriate, 3 = Unsure, 4 = Inappropriate and 5 = Very Inappropriate

- Publishers and book sellers (e.g., Amazon.com, academic book publishers)
- Subscriptions (e g , for newspapers/ journals/ magazines)
- Restaurants (e.g., McDonalds)
- Drinks (by implication alcoholic)
- Finance (e.g , banks/loans)
- Media/Music (e.g., CDs, films, videos)
- Job vacancies
- Tobacco companies
- Clubs
- Educational event organisers
- Mobile phones
- Travel
- Food
- Insurance
- Cars
- Shops
- Chat rooms
- Games
- IT retailers (e.g. software and hardware suppliers)
- Contraceptives
- Counselling (e g drug or abortion advice)

We also asked about age and how familiar the respondents were with JANET, as we hoped to undertake correlation analyses between these independent variables and attitudes to advertising.

The JANET stakeholders questionnaire

Specific questions referring to the funding of JANET and the logistics if commercial activity were permitted were posed. Attitudes to advertising in general were posed Other questions were open-ended For example

Q8 Does the JISC already have the resources to set up such a system or do you feel they should create a special division/team to run this project? Please comment

Q9 Who should have the ultimate say of what advertisements are allowed on JANET? For example, should advertisers have to apply to a JISC committee, or to specific individuals or services?

Q10 How should the advertisers be charged for advertising on JANET, e.g , a monthly fee, based on the number of times a user clicks on the advertisement?

Q11 How feasible do you believe it would be to give customers the option of either JANET free if it has advertisements, or a charged-for JANET that has no advertisements? Please comment.

Q12 Where do you feel the money should be invested if raised from online advertisements?

Q13 Do you believe placing adverts on JANET will alter the image it presents to its users? Please comment.

The e-mail questionnaires were sent out in November 2000.

Diane Macdonald's study, which commenced in the end of February 2001, is investigating:

1. Potential income and cost effectiveness of advertising on JANET
2. The impact of advertising on network traffic.
3. JANET acceptable use policy implications.
4. The possibility of setting up an advertising service for JISC.

Through their investigation, it emerged that the new universities tend to be pro-advertising on JANET, and the older universities tend to be against advertising, arguing the image of the university will be effected if adverts were allowed on services like JANET.

Results of the JANET user questionnaire

There were 22 replies from the questionnaire sent out to the sample of JANET users, all members of the Loughborough Information Science Department 72.7% of the responses were students. Fifteen females and seven males replied The majority of the participants were between the age of 21 and 30 years. All participants said they used the Internet every day

Not surprisingly, the majority of participants stated they were very familiar with using the Internet. Nobody said they had little or no knowledge of the Internet. The majority of the respondents used two or more different Internet search engines. The most frequently used search engines were Google, Yahoo! and AltaVista

Sixteen respondents stated that they had not clicked on an Internet advertisement. The six people that said they had clicked on an advertisement on the Internet had never resulted in a purchase. Despite this, over half of them had made a purchase from a dot com company No doubt many of these purchases were from amazon

There were a number of reasons why people used JANET The most common reasons were for e-mail, the Internet, research and academic enquires.

None of the users strongly agreed with permitting advertising on JANET and only four agreed. Over half the users who responded to the questionnaire either disagreed or strongly disagreed, and the remaining few had no opinion, see Table 2 below

Table 2 *What would be your attitude to advertising on JANET?*

1 =	Strongly Agree	0
2 =	Agree	4
3 =	No opinion	6
4 =	Disagree	9
5 =	Strongly Disagree	3

When asked whether adverts on JANET should be restricted to certain areas of the system, most users were indifferent, stating that the adverts were easy to ignore. There was a suggestion that the adverts appear at the top and bottom of the web pages to avoid distraction. The users also expressed a concern that the adverts should not appear amongst academic information or documents but should be restricted to the more 'general' areas of the system Despite having a negative attitude towards allowing advertising on JANET, over 70% of the users would continue to use JANET if adverts were placed on the web pages.

Table 3 shows the results of our question regarding particular types of advertisement. Tobacco company adverts were seen by nearly all users as totally inappropriate The total score for Tobacco adverts was 100; the highest score possible would be 105 if every participant in the questionnaire rated it as '5' Other inappropriate adverts were for games, drinks, shops and restaurants

When asked whether they felt it was feasible to have the option of a free JANET with adverts or a charged-for JANET without adverts, there was a mixed response. Half the users felt it **would** be feasible and half felt it would not Some of the reasons why the users felt that the option would be feasible are shown below

Table 3 *Appropriateness of particular types of advertisements*

Key:
1 = Very Appropriate
2 = Appropriate
3 = Unsure
4 = Inappropriate
5 = Very Inappropriate

Which advertisements would you deem acceptable on JANET?

	Total	Average	Mode
Tobacco companies	100	4.55	5
Games	92	4.18	4
Drinks	89	4.05	4
Shops	88	4.00	4
Restaurants (e.g., McDonalds)	87	3.95	4
Cars	87	3.95	4
Chat rooms	85	3.86	4
Clubs	83	3.77	4
Mobile phones	82	3.73	4
Food	82	3.73	4
Insurance	79	3.59	4
Finance (e.g., banks/loans)	78	3.55	3
Media/Music (e.g., CDs, films, videos)	75	3.41	4
IT retailers	75	3.41	3
Contraceptives	75	3.41	3
Travel	73	3.32	4
Counselling (e.g., drug or abortion advice)	64	2.91	3
Subscriptions	51	2.32	2
Educational event organisers	51	2.32	2
Job vacancies	48	2.18	2
Publishers and book sellers	47	2.14	2

- It would be quite complex to administer but would be worth the effort
- There are already commercially available products such as 'Adfilter' which enables you to filter out advertising content, although this might discourage advertisers from placing advertisements. If income has to be supplemented then users should either pay or accept advertising as a necessary evil.
- People will always go with the free option. I do not think that adverts would have a detrimental effect, but it would be nice not to have any.
- JANET should use advertising. Those who are affected by it should just be more motivated and not get lost on the Web, plus, they can up numerous opportunities to people! JANET risk losing users if they make it subscription based.
- I think this probably would be feasible, it might be good for those who mainly use JANET in hall, etc. On campus, in departments, there should be no adverts
- I think if people want the system for free they are going to be willing to allow advertising, but people are probably less likely to want to pay for the sake of it being advertising free.

Some of the reasons why the users felt that the option **would not** be feasible are given below:

- Not feasible at all – likely to be unworkable in practice
- Students are bombarded by too much advertising as it is Companies seem to think student loans give students ample spending power If you give students the choice they will naturally choose a free service with adverts, although the adverts probably will not be of benefit to them. Students do not really have a choice in such matters of finance.
- Adding adverts will increase the amount of cookies sent to machines, take up space on hard drives and make the whole system less secure.
- Not very feasible because charging for the JANET service would cause disruption among students. It would not be fair to charge for a service, which can easily be given for free, that students need in order to complete studies.
- I am of the opinion that all services which have an educational purpose should be free without having to have advertisements, however, if there is no choice, I would prefer JANET to have advertisements if that would make the service free for all Hopefully, that advertisement would have its limits in being relevant.
- I think it would be difficult to give individual customers (such as individual students) an option, especially if they do not have their own computer, or individual IP number, as this would seem, to me, to be difficult to police.
- Unfeasible, students are not likely to pay for the service, which stops them being users.
- I believe it is not very feasible because the price charged to a student is not a determining factor for the reason why they use it.
- Cash-strapped education institutions are unlikely to want a charged for JANET. However, the palatability of an advertising-supported JANET will depend on the adverts and how they are presented
- I feel this is unnecessary and inappropriate Access to services such as JANET should be provided at no extra cost to students, with or without advertisements. I think advertisements can either be harmless or distracting, depending on the type and positioning.

We attempted to correlate independent variables with respondents' attitudes. Unfortunately, the data was insufficient for such an analysis except in one case. We carried out a Spearman's rank order correlation coefficient test on the data on length of experience on JANET compared to attitudes to advertising. The rank order correlation r_s was –0.0262, (Diamantopoulis and Schleglich, 1997; Mindenhall and Beaver, 1994), indicating a weak negative correlation between length of time using JANET and willingness to consider advertising, but this result is not statistically significant It was clear that males rated more of the adverts inappropriate than females, but there were no particular advertisements that females thought were acceptable that males did not, or vice versa. Unfortunately, there was insufficient data to carry out a Wilcoxon rank sum *W* or a chi squared test on this data to assess whether there was a significant difference between the attitude of men and of women to advertising on JANET.

Results of the JANET stakeholders' questionnaires

Only two stakeholders replied to the questionnaire. Because of the small sample, it was impossible to draw any conclusions. However, we have noted below those questions where both respondents were in agreement:

Question 2. Adverts on JANET would deter me from using the service
Answers: Stakeholder 1 = **Strongly Disagree**
Stakeholder 2 = **Disagree**

Question 3. I am irritated by adverts on websites.
Answers. Stakeholder 1 = **Strongly Agree**
Stakeholder 2 = **Agree**

Question 4. I am happy with the way JANET is funded at present
Answers: Stakeholder 1 = **Disagree**
Stakeholder 2 = **Disagree**

Question 5. I am satisfied with the service JANET provides.
Answers: Stakeholder 1 = **Strongly Agree**
Stakeholder 2 = **Strongly Agree**

Question 6. I believe the service JANET provides could be improved with additional funding.

Answers· Stakeholder 1 = **Disagree**
Stakeholder 2 = **Disagree**

Stakeholder 1: Questions 7-12 assume agreement with the notion of advertising on JANET. I strongly disagree with funding JANET in this way It would change the nature of the service completely, and seriously pose the question 'Why JANET?' Institutions might as well switch to an ISP. As far as my work is concerned I depend very heavily on JANET to communicate with colleagues in universities. I need a quick, dependable, no-frills service. Advertising would be a severe irritant. At home, where I use a commercial ISP, and surf the Web it is different (if sometimes irritating). I choose to put myself in a position to receive adverts there

Stakeholder 2. In general I am against advertising. However it is clearly a source of income that cannot be ignored

Discussion of the results

The response rate for this survey was low, so although certain common themes can be identified, they must be treated with caution as they represent the views of a small sample of JANET users. It appears that people would prefer JANET to stay an advert-free service, but if commercial activity were to be implemented they would still use the system. This result is similar to that of Rowland and Rubbert (2000) which showed that part time and distance learning students preferred to have a free electronic information service with advertisements than to pay for electronic information.

We had initially predicted that the younger users of JANET would have a more positive attitude for allowing advertisements on JANET. This hypothesis was not proved; all respondents had a negative attitude to adverts.

Both stakeholders and users stressed adverts should not appear on e-mails; this is probably due to fear of invasion of personal privacy The main reasons why adverts would deter people from using JANET are because they are irritating and will slow down the system. Both stakeholders who replied to the questionnaire firmly believe at present JANET is funded satisfactorily.

None of the users or stakeholder rated any of the given adverts 'very appropriate' This was not surprising, as most of the users would not like to see adverts on JANET in the first place. The adverts seen as most appropriate to allow on JANET were education-related (e.g., publishing and book sellers, subscriptions). Perhaps surprisingly, contraceptives were seen as quite acceptable on JANET. Stakeholders and users both voted tobacco and games as the most inappropriate advertising to appear on JANET.

The arguments FOR advertising on JANET

- The advertising could be handled in a way that allows users to have a choice of whether to view the adverts or not and the right to veto over content.
- If the right advertising was chosen correctly and handled sensitively, it could have a positive impact and be useful
- Advertising of a sponsored nature or linked to academic research material would be appropriate
- Advertising is an effective money-making tool, any excess revenue could be ploughed back into improving the service.

The arguments AGAINST advertising on JANET

- Advertising could undermine the independence of JANET, monitoring and controlling the ethical and appropriateness aspects of the adverts, requires more resources and increased administration work. It will also generate previously unrequited marketing employees/resources
- Advertising normally goes hand in hand with unsolicited SPAM This will discourage users from using e-mail lists and could be seen as an invasion of privacy Junk e-mail and cookies generated by adverts take up a lot of space on hard drives This also has security issues that need to be addressed
- Too much advertising makes the site look unstructured and difficult to navigate around This may lead to attention being drawn away from its primary use, i.e. education.
- In addition to the site looking cluttered and

unstructured, adverts normally contain complex graphics, images, FLASH technology and sound. They are also often JAVA applets that altogether slows down the download time of the web pages.

- Services that are for educational use only should be free of charge and minor institutions with less cash will not want to pay for this service. This could give the appearance of a badly funded higher education system in the UK JANET risks losing users if they make it subscription based.
- Complex advertisements may interfere with the running of other applications.

Business models for advertising on JANET

In this part of the paper, we highlight the pros and cons of each of the major business models we have identified, and other factors that need to be considered if advertisements are to be accepted.

Advert free

Advantages

- It maintains the scholarly feel of the present network.
- JANET will remain a private service Private networks do not have to adhere to the Regulation of Investigatory Powers Act.

Disadvantages

- The HEIs will have to pay for the service directly through fees, indirectly through top slicing of funds, or by a combination of the two.
- Some HEIs may not be able to afford the service. This could mean they have cut back on budgets in other areas, or not offer a full JANET service to their staff and students.
- If HEIs are paying for JANET they will have higher expectations of the services provided.
- HEIs may appear old fashioned by not developing relationships with advertising companies.
- HEIs may have to charge staff and students for their use of JANET.

Choice of advertising free/advertising areas

Advantages

- Institutions that are firmly against advertising can opt out
- Institutions have a choice, and can change their minds from year to year.

Disadvantages

- Adverts reduce the scholarly feel.
- There is a danger that this model may not make/generate sufficient income to cover the costs.
- JANET does not remain a wholly independent network.
- Complicated model

No choice: advertising is provided

Advantages

- JANET remains free at point of use.
- All HEIs are provided with the same service.
- Returns made through advertising can be invested into the services for the community that otherwise may not be sustainable.
- Advertising will help refresh the image of JANET.
- Foster relationships between HEIs and the advertising companies.

Disadvantages

- Concerns that commercial activity will threaten academic independence.
- Sponsorship of particular services by 'interested parties' could raise questions about impartiality of the information they provide
- Contract agreements may place restrictions on the use of competitors' products in the sector. To avoid this, controls and checks will have to be enforced
- The inclusions of commercial activity on JANET may cause irritation to some users, and may drive some users away from the services.
- Adverts may slow down the system and the quality of the service could diminish.
- Institutions that are strongly opposed to advertising do not have a choice.
- Advertising could give the appearance of a badly funded higher education system in the UK.

- Initial set up and consequential administration may be complex and beyond the current resources or expertise.
- Need to develop codes regarding who can and cannot advertise. It will be difficult to reach agreement on this issue.

Advertising policy: general principles

Advertising and sponsorship messages should be sensitive to issues of social responsibility and should conform to the present code of practice for advertising on JANET and other relevant codes (e.g., Advertising Standards Authority) and the generally accepted principles of sales promotion The products/services permitted on the web pages should have relevance to the users and should have the capacity to add value to their education or daily life. The advertising should not conflict with or detract from the universities' policies or give offence to the user community It should also not detract from the purpose of the web pages or documentation. JISC (or some body nominated by it) would have the right to reject any materials that is deemed inappropriate.

There are three possibilities for who will actually run the advertising service. JISC or one of its current sub-committees; a new body created by JISC for the purpose, or an outside organisation.

A section of the current JISC organisation could take responsibility for the running of this service. This would be preferred if JISC wished to remain in complete control of the provision of JANET. However, JISC staff may not have the expert knowledge of how to run the advertising service. Therefore, additional training would have to be undertaken, or new staff recruited. Alternatively, a new group could be formed by the JISC. Finally, the running of the advertising service could be outsourced to an agency that specifically deals with such programmes This has the advantages of relieving JISC of the administration processes and the agency will have greater experience and expert knowledge to run the service efficiently However, it may be more costly to do this and JISC may not be as directly involved in the decision making.

Whatever the organisation that runs the advertising service, it would have certain clear responsibilities, including

- striking deals with advertisers on behalf of all JISC services;
- adhering to the code of practice and policy agreements;
- billing and collecting revenues,
- collecting and delivering information on traffic to sites,
- monitoring the impact of advertising on service delivery;
- meeting or exceeding revenue targets agreed with the JISC,
- administration;
- maintenance and monitoring of advertisement pages;
- maintaining consistency;
- complying with, and verifying legality.

An alternative to JISC or an outside organisation handling the advertising service is that all higher education institutions (HEIs) pay for JANET advert free, but permit the placing of adverts on the system locally. This means that the HEI will have to run the advertising service but can generate revenue. This means that those institutions that do not want adverts on JANET do not have to have them, but those that cannot afford to pay for JANET can cover their cost through commercial activity. There would have to be a common policy and code of conduct that all institutions would have to follow, which would be devised by JISC. Of course, the HEIs would have to set up their own processes for administering the advertisements Another advantage in this scheme is that HEIs would be able to develop relationships with the advertising companies This would be extremely beneficial, for example for HEI relationships with local employers.

Who are likely to be acceptable as advertisers?

Based on our research, we suggest the following would be acceptable: publishers and book sellers, employers with job vacancies, educational events, and counselling services. The following types of advertisements would not be acceptable: tobacco products, games, alcoholic drinks, shops, and restaurants. Certain other types of advertisements, e.g. for pregnancy testing or contraceptives, engender strong opinions and to avoid controversy would probably be best not permitted.

Areas of JANET where advertisements should or should not be placed

There are some self-evident ground rules that should be followed. Acceptable areas for advertising include home pages, newsletters, and menu lists. Equally, certain areas are not appropriate for advertisements, such as in e-mails, discussion lists, exam documentation or university regulations, codes of practice and policy statements

Possible charging models

A number of algorithms could be used:

- How many hits (a hit is the loading of a single file whether an HTML file, an image, an audio file, or other file type)?
- How much time spent on the advertisers' websites?
- How many pages does the user visit?
- How many orders for product or service?

The cost could also vary depending on size, colour, number of times it is loaded and length of time it is maintained.

There are three different basic methods for computing the cost of WWW adverts: flat fee per month, cost per thousand people who see the advert, or cost per click through Advertisers prefer this latter form of payment, because they are only paying for the people who are linked to advertiser's web page. The average ClickThrough Rates (CTR) in the USA is 5 cents per hit (Martinez, 2000). Using a CTR of 2p per hit means that 100,000 hits per year would generate £20,000 a year.

Who is the advertisement audience?

Students make up a larger portion of the user base However, staff have more disposable income and are more influential. Our survey did not show differing opinions between staff and student JANET users as to the type of advertisement preferred It is reasonable, therefore, to assume that adverts useful to both types of user would be most suitable

User privacy needs to be respected The user has the right to refuse the transfer of personal data to an advertiser Personal data should not be disclosed unless authorised. A privacy policy should be drawn up and made available to users

When purchasing products or services over the Internet, users must give their names, e-mail addresses, mailing addresses and credit card numbers with expiration date. This is personal data that must only be used for that one purchase and must not be shared or sold to third parties for any purpose

Conclusions and recommendations

Ideally, the best solution would be to allow HEIs the choice of paying for an advert free JANET or receiving a free JANET with adverts However, this appears to be a complex solution. We suspect that there would be more resistance by HEIs to paying for JANET than keeping the service free of charge but containing advertisements. Therefore, we recommend that advertising be placed on JANET for a trial period. During this period, reactions from users and the HEIs should be gathered.

If it is decided that JANET should hold adverts, we suggest that responsibility for running this should be given to a JISC controlled not-for-profit organisation. It would probably be necessary to employ a consultant to set up the service beforehand, though. We further suggest that initially a flat rate fee should be charged, for example £70 per month As adverts have never been placed on JANET before, it would be hard to predict at this stage the appropriate cost per thousand or a CTR.

The advertisements must conform to the UK Advertising Standards Authority's rules, together with extra rules JISC may wish to impose The JANET Acceptable Use Policy would have to be updated The Data Protection Act will have an impact on providing/selling e-mail lists, and all parties must agree to abide by its requirements, and those of the EU E-commerce Directive

Bandwidth should be utilised in such a way as to minimise swamping the network. This could be achieved by monitoring the proportion of advertising volume to the medium employed.

Naturally, HEIs should be consulted initially before introducing such a service. For example, their input is needed for developing the rules for the types of advertisements that are acceptable, and those that are not

Initially the intention will be to reduce the costs of running the JANET service. In the unlikely event that JANET ends up making a profit thanks to its advertising revenue, it should be reinvested into the community as a whole.

No intrusive advertising, for example 'banners', should be used. Similarly sound enabled or pop-up windows should not be used. Advertisements should be restricted to pre agreed areas. All adverts must follow the necessary standards so that they can be easily read, or ignored, by those with disabilities

Overall, we have found that permitting commercial activity on JANET may be a viable means of generating revenue Although JANET presently escapes the world of advertising, it cannot ignore the potential it also carries. There are many fears with the introduction of commercial activity on JANET, such as the threat to academic independence and loss of scholarly feel. There are also questions regarding the impartiality of the information provided and restrictions adverts may cause over competitor products. These fears must be addressed Perhaps it is inevitable that the present nature of JANET will have to change some time in the future.

The implications of introducing advertising on JANET do not appear to be as severe as predicted Monitoring the traffic congestion on the network will ensure service performance is not affected greatly with the inclusion of commercial activity The present JANET policy does not forbid the use of advertising on web pages.

The main concern of JANET users is the irritation adverts will cause. It seems that if adverts were introduced on JANET they would annoy some users, but they would *not* deter them from using the service. It does appear to be feasible to allow adverts on JANET and continue to supply the service free of charge. However, it is less clear how feasible it would be to give HEIs the choice of a free JANET with adverts or a charged for JANET without adverts. Fortunately, there does appear to be a general consensus amongst the JANET users surveyed as to the type of advertiser acceptable It seems to us that the time is ripe to undertake an experiment with advertising on JANET.

The implications of our research for other services in other countries are that opposition to advertising by users may not be as strong as some fear, and that use of selective advertising may be a useful method for certain free at the point of use services to survive or prosper. However, there are many implications of permitting such advertising, and any such development should not be undertaken unless these implications have been fully explored.

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Enhancing knowledge exchange through Communities of Practice at the Inter-American Development Bank[1]

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A relatively new and spontaneous organisational form, simply referred to as Bank Networks or Communities of Practice (CoPs) (informal groups of professional workers who share similar interests and goals), have emerged in the past few years at the Inter-American Development Bank (IDB). They are complementing the existing structures and enhancing knowledge exchange and organisational learning. These Bank Networks position the Institution in an optimal situation to explore to a greater extent the benefits of knowledge exchange and leveraging of institutional knowledge The article examines, evaluates and gives the main findings of an empirical study of the nature, structure and activities carried out by the existing Bank's Communities of Practice. Some ideas as to whether organisations should be supporting and encouraging the formation and development of Communities of Practice, and whether and how their proliferation should be fostered, are offered for consideration.

Introduction

There is a growing acknowledgement that the operational success of any organisation or institution will increasingly rely on their ability to leverage institutional knowledge Based on this premise, it seems there is movement from the principle that the truly significant knowledge that an organisation possesses is tacit[2] (knowledge in people's heads). The rationalisation behind this is that tacit knowledge essentially remains with the individual rather than being accessible to an organisation at large. Building up on this theory, the 'organisational collective knowledge' idea has been cultivated and rooted within the new 'Communities of Practice'[3] school of thought.

This school of thought formed by researchers and practitioners drawn from anthropology, social development, management, and information systems and computer science, proposes that knowledge is generated not just tacitly, but collectively (Kleiner, 2000). The results of these studies, as well as current organisations' knowledge management strategies, suggest that the most critical know-how in any given company is not stored in its computer system or the 'institution's rule book or manual', but in its casual conversations (Kleiner, 2000), self-organised group interactions, and also individual relationships (Lesser and Prusak, 1999).

For the last decade or so, Communities of Practice as an organisational concept have received much attention from many institutions, organisations, governments and development agencies These Communities of Practice are seen as a mechanism for knowledge sharing and learning across and within hese institutions, based on the common ground of a professional discipline, a skill, a opic, a business process (McDermot, 1999).

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[1] This article represents the personal views of the author, and not necessarily those of the Organisational Management Services Office (ITS/OMS) or the IDB It complements the *Knowledge Exchange & Networks* Report prepared by the author under the guidance of Jean-Pierre Béguin and Julio Estrada, at the time Co-coordinators of the Knowledge Exchange Network Steering Committee (KENSTEER) at the IDB

[2] Described in the theory of organisational knowledge creation (Nonaka and Takeuchi, 1995).

[3] This term was first coined by Lave and Wenger (1991).

Although these Communities of Practice could play a critical role in creating, sharing and applying institutional knowledge (Lesser and Prusak, 1999), the question is whether or not organisations and institutions should nvest time, energy and financial resources in supporting these informal groups and view hem as the vehicles for managing their organisational knowledge. Likewise, it is argued if here is a universal approach to implement/support Communities of Practice that institu ions should take to cultivate and leverage nstitutional knowledge assets that reflect heir culture and business drivers.

Research context

When the Inter-American Development Bank's (IDB) Management approved in 1999 the establishment of an inter-departmental co-ordinating group, KENSTEER (Knowledge Exchange Network Steering Committee), it was recognised the importance of institutional knowledge and the intellectual assets of the Bank. Since its inception, KENSTEER has been exploring the potential of knowledge exchange and leveraging institutional knowledge principles.

KENSTEER observed and showed interest n the knowledge exchange activities that were taking place within informal groups at the Bank It was apparent from the outset that nformal Bank Communities of Practice, often referred as to Bank Networks, had been emerging spontaneously at the IDB. KENSTEER requested the author to review the informal/formal IDB Networks and to analyse what was necessary to support existing and future Communities.

There is no agreed use of terms nor prevalent agreed terminology or definition of Communities of Practice at the IDB. Terms such as Clusters, Networks, Communities of Practice and Thematic Groups are used interchangeably and/or with different scope and perspectives, as is common within the IDB, lending themselves to multiple interpretations Nonetheless, the following definition from Wenger et al. could be taken as a point of reference:

> Communities of Practice are groups of people who come together to share and to learn from one another face-to-face and virtually They are held together by a common interest in a body of knowledge and are driven by a desire and need to share problems, experiences, insights, templates, tools, and best practices. Community members deepen their knowledge by interacting on an ongoing basis and, over time, develop a set of shared practices (Wenger et al. Cited in· APQC 2001).

Likewise, since the term 'Knowledge Management', defined as: 'a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that will improve organizational performance' (APQC, 1999), is seen to some extent as an ambiguous term within the IDB, this article also agrees with KENSTEER's views preferring to use the term 'Knowledge Exchange' As mentioned in the KENSTEER basic report (Béguin and Estrada, 1999), Knowledge Exchange is a better way of defining the necessary qualities of interaction, equality, reciprocity and decentralisation in relations between partners of the knowledge endeavours.

The Inter-American Development Bank (IDB), the oldest and largest regional multilateral development institution, was established in December 1959 to help accelerate economic and social development in Latin America and the Caribbean. The Bank's original membership included 19 Latin American and Caribbean countries and the United States. Eighteen non-regional countries joined the Bank between 1976 and 1993. Today, Bank membership totals 46 nations In addition to the Bank, the IDB Group consists of the Inter-American Investment Corporation (IIC) and the Multilateral Investment Fund (MIF). The MIF was created in 1992 to promote investment reforms and to stimulate private-sector development In carrying out its mission, the Bank has mobilised financing for projects that represent a total investment of $263 billion. Annual lending has grown from the $294 million in loans approved in 1961 to $5 2 billion in the year 2000 The Bank, whose headquarters are in Washington, DC, has Country Offices in each of its borrowing member countries and in Paris and Tokyo.

Aims and objectives

The overall aim of this research was to identify and take a snapshot of Communities of Practice at the IDB. It also aimed to provide a review of their function, nature, needs and constraints of, and to identify the activities carried out by them The purpose of this study was to know more about the Bank Networks, not to interfere in any bureaucratic way with their natural course of action.

The objectives of the research were as follows·

- To identify and to create an inventory of the individual IDB Networks
- To visualise the core functions, different nature, structure, size and composition of the main IDB Networks.
- To identify and assess the resource requirements and basic needs for the Networks.
- To analyse and recommend possible actions and activities that the Networks could support and/or facilitate in enhancing their ability to meet current strategic objectives.
- To briefly analyse the potential role of KENSTEER in supporting and encouraging the formation and development of Bank Networks if required by individual Networks.

Methodology

As a result of several factors, such as the size of the organisation, attitudes towards the issue being studied and time constraints, a number of methods were used combining both qualitative and quantitative approaches during the period of research that spanned the four months from June to November 2000. The emphasis, however, was on the qualitative approach. An initial questionnaire was sent by KENSTEER co-ordinators to collect basic information on the Bank's Networks. Following up on the questionnaire, 36 semi-structured interviews and meetings were conducted by the author mainly with Network co-ordinators and KENSTEER members representing different divisions and departments. Two focus groups with more than 25 participants, mainly Network co-ordinators, were conducted where the first draft of the resulting report was discussed. The results of the existing survey and the feedback from interviews and focus groups were analysed for insights into the issues being addressed A full meeting of KENSTEER was devoted to the presentation and discussion of the author's draft report on Bank Networks Reactions and feedback from more than 40 participants were received and taken into account before a final report was issued (Moreno, 2001). Following up on the report, a brief update was carried out during May 2001.

Findings

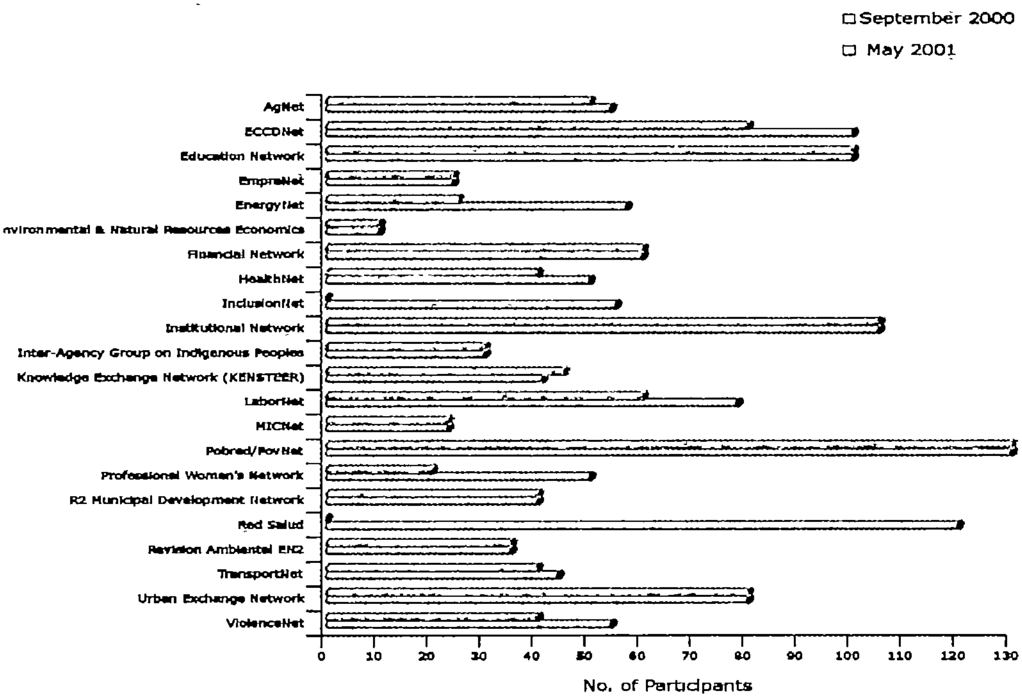
A relatively new, informal and spontaneous 'organisational form' commonly referred to as Thematic Networks or Communities of Practice (CoP), i.e. groups of professional workers who share similar interests and goals, has been emerging and flourishing at the IDB This has been particularly so since the break-up of technical 'families' as a result of the reorganisation of the operational area of the Bank in 1994.

The IDB Networks, often referred to as thematic groups in other institutions or corporations, are mainly sector/thematic oriented and demand driven. They seem unconsciously to complement the existing structures, enhancing knowledge exchange, and enabling powerful new forms of social organisation and learning, which reflect the participation of members.

As in many other organisations or institutions (e g World Bank, BP Amoco, and the UNDP), these are communities of professionals who share similar interests and goals. At the IDB, they seem not to be intended as a substitute for existing institution units or departments, but rather as extending beyond them across regions and themes. Network participants learn from one another by solving real problems, sharing information, experiences and knowledge either through face to face interactions or by other mechanisms

The Bank's Communities of Practice are thus offering a space for dialogue among those working on similar issues These groups igure 1 *IDB Networks Participants*

	May 2001	September 2000
Total number of Network members	1384	1081
Average	61 17	52 47
Median	54	40



re self-organised, setting their own basic bjectives, often implicitly, and establishing heir own leadership. Membership is largely oluntary and self-selected (see Figures 1 and). Although Communities of Practice could perate across institutional boundaries, as is ot unusual within the IDB, it seems that ost of the IDB Communities of Practice are nterdepartmental and thematically based.

Thus, the Thematic Interdepartmental etworks are the most common types of ommunity of Practice that inevitably merged since the 1994 reorganisation. As it an be appreciated from the inventory list, he knowledge domain of most of the 22 roups that were identified during the research are strategic in nature (see Figure 3, IDB Networks).

The aim of the IDB Networks could be summarised as follows:

> ...to serve as a [virtual] forum for professional staff to promote knowledge generation and dissemination, and as a way to connect staff from various departments in the Bank that are working or interested in similar issues.[4]

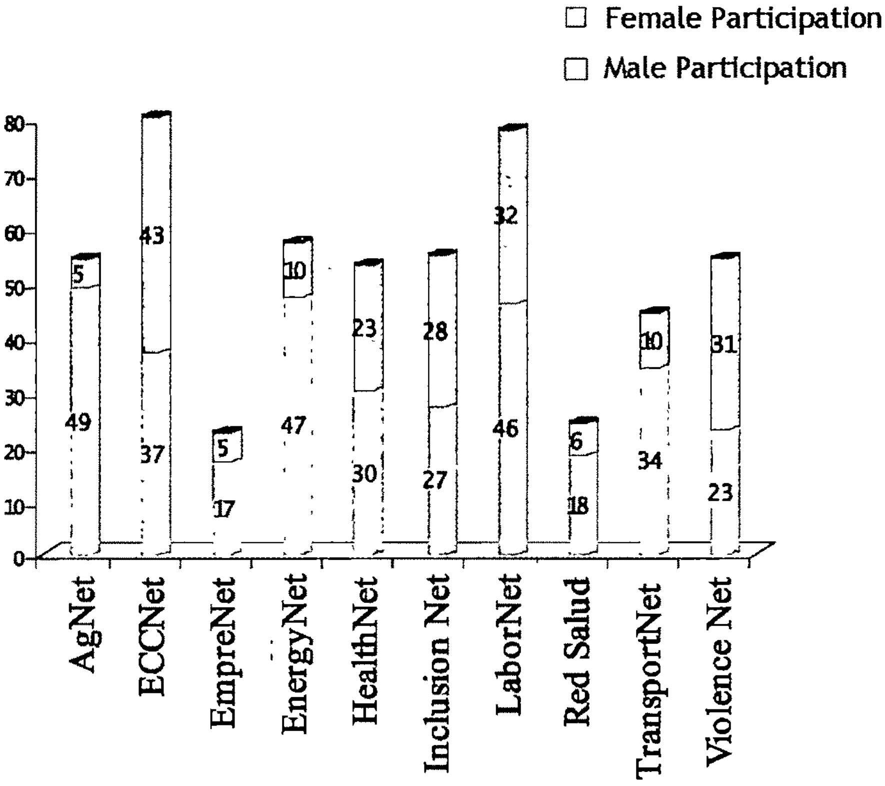
These Networks are often unconsciously addressing the issue of professional isolation of technical staff and bridging the gap between technical families across the Operational Regional Departments (Divisions) and Country Offices within the same or a different Department. This is accomplished by exchanging information/knowledge within the members of a community with similar interests and needs.

Adapted from LaborNet's email on October 22, 1999 hat announced the creation of the Network

Network leaders, commonly referred to as co-ordinators or facilitators, seem to have emerged spontaneously too. They provide intellectual leadership and have a talent to facilitate and draw people. Their main role is facilitating and coaching knowledge processes and activities.

While most of the Bank Networks could be regarded as 'continuous' or 'semi-permanent', Networks are also somewhat 'fragile', often dependent on the presence of one or more exceptional individuals who have 'emerged' spontaneously and who devote time to the Network. The size of the Networks, as determined by the number of participants or members, varies greatly. Membership, which is fairly representative of most departments and units, ranges from little more than a dozen to nearly 180 and is open to the entire Bank (see Figure 1, Network Participants). Member's participation is by and large unregulated and discretionary.

Figure 2. *Gender Network's Participation*



It appears that the existence and the use of new information and communication technologies (ICTs) have been acting as an enabler for the proliferation of the Network's development activities. The degree and level of intensity of Network activities varies greatly according to the level of formality, demands and needs. Most Networks have met on several occasions and sponsor activities at periodic intervals. Emphasis is mainly made on the exchange of information, knowledge and learning.

Figure 3 *IDB thematic interdepartmental networks*

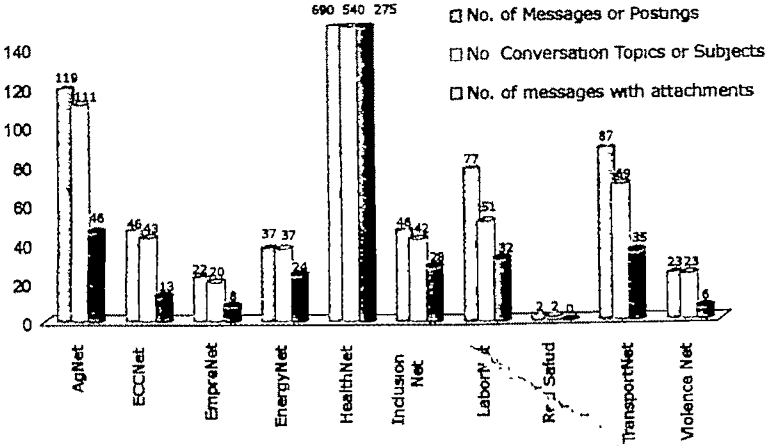
Network	**Sector/Thematic area**	**Active since:**	**Members**
AgNet	Agricultural and Rural Development	1995	57
ECCDNet	Early Childhood Care and Development	1996	100
Education Network	Education issues, strategies and projects	1995	100
EmpreNet	Competitiveness, PYMES, business environment, competition policy, technology	2000	24
EnergyNet	Energy related issues	2000	57
Environmental & Natural Resources Economics	Environmental and natural resources economics	1999	10
Financial Network	International Finance/ Financial Economics	1999	60
HealthNet	Health sector reform	1999	50
InclusionNet	Combating Social Exclusion and promoting Social Inclusion of all racial and ethnic groups in the Region	2001	55
Institutional Network	Institutional Development with respect to IDB programs and projects in the region	2000	105
Inter-Agency Group on Indigenous Peoples	Indigenous peoples and community development	1993	30
Knowledge Exchange Network (KENSTEER)	Knowledge Exchange and Knowledge Management issues	1999	45
LaborNet	Labor Markets	1999	78
MICNet	Microenterprise development, new trends, funds availability and any other topics related to the sector and the support of NGO's and Private Microenterprises in the LAC	1996	23
Pobred/PovNet	Poverty and Inequality reduction	1998	174
Professional Women's Network	Promotion of gender balance throughout the Bank's corporate structure at Headquarters and in the Country Offices.	1994	50
R2 Municipal Development	Municipal Development	2000	40
Red Salud	Fortalecimiento y promoción de la Salud Pública y de programas dirigidos a grupos poblacionales, en América Latina y el Caribe.	2001	120
Revision Ambiental EN2	Revisión de las operaciones de RE2, en relación al impacto ambiental	2000	35
TransportNet	Transportation issues	1999	44
Urban Exchange Network	Urban/local development and housing	1999	80
ViolenceNet	Violence prevention	2000	54

Figure 4 *List of main Network activities*

- Dissemination about general technical information.
- Act as link with external interagency networks (exchange of information and experiences).
- Sponsor and organise conferences, brown bag lunches by IDB staff or by external specialists
- Virtual discussions on topics of interest (the discussion clusters in Region 2 are a good example)
- Organisation of specialised small technical working groups.
- Dissemination of information bulletins on projects and issues of interest.
- Support of training programs.
- Periodic meetings, support other training, perhaps assist with best practices.
- Organising seminal topics in sectors, based either on current Bank projects in preparation or presentations by outside guest speakers.
- Dissemination of information and announcements about upcoming events.
- Soliciting assistance and advice from colleagues (names of consultants, source materials).
- Co-ordination of the implementation of sector strategy
- Exchange of information best practices, performance benchmarks, and experience with Bank programs in the area of interest
- Help desk or pool of skills to help project teams.
- Co-ordination of policy recommendations across sectors and co-ordination of specific Bank interventions at country or city level Also discuss technical issues related to economic analysis of projects and issues related to Bank policies.
- Formal meetings and presentations in other institutions (e.g. the World Bank) about IDB experiences in certain areas.
- Exchange literature reviews and identification of issues where the Bank needs to clarify its policies or improve its understanding and propose studies to address those topics.
- Support Network members with the review of work undertaken by consultants and with the identification of leading figures suitable to address difficult issues in project preparation.
- Monthly presentations, technical seminars, training sessions, annual retreat, listserv, co-ordination of IDB representation at external events, peer reviews.
- Sharing of information on projects and research, setting group priorities for Bank's agenda (policy research and consultation needs).
- Helping Network members with specific data/information needs via e-mail
- Sharing insights and generation of discussions on new developments in a particular field
- Calendars, contacts sharing and proposals for new ideas.

Resources and basic needs seem to be a critical issue for the IDB Networks. Although some of the Bank's Networks are largely self-sufficient and do not have a proper budget, they have stated explicitly that they would benefit from some funding and resources to carry out and cover the expenses of related activities. However, Networks do not want to be treated like another unit or working group in the requirement to establish output accountabilities, even though some indicators of their performance would be very valuable to illustrate their benefits to Management. It seems that some IDB units and departments from the operational and support areas of the Bank are playing a major role in facilitating the creation and development of some Networks. They are also providing assistance and support to strengthen Network activities

There is a wide but uneven range of activities performed by the Networks (see Figure 4 List of Network activities). Although there is igure 5 *Level of participation in Networks' Ms-Outlook Public Folders (last update 7 May 2001)*



his variety, the volume of interaction could potentially and strategically be much higher. The range and intensity of activities and products will depend on the needs of the Networks, but they are also constrained somehow by the technology currently being used and by the level of contributions by Network co-ordinators and members.

These activities and the tasks performed are often seen by the co-ordinators, and presumably participants, as an adjunct to their work Consequently, leaders and participants are only able to contribute limited time to the Network given their other responsibilities.

Apart from the face-to-face interactions, hat are considered very important, other ools like e-mail, distribution lists, and the use of Electronic Public Folders are most commonly used to function as a virtual forum space for professional staff in the Bank and as aids to discussion and member's communicaion However, there is some knowledge among the Networks' co-ordinators of the potential and available technology within the Bank The technology currently being used by most of the Networks seems to be limited, and only a few Networks seem to make use of the advantages of intranet and extranet technologies to pursue their plans and objectives.

The level of participation in the Networks' Public Folders (see Figure 5) varies according to the Network and its needs. This can be appreciated by the number of messages/postings in each Network. However, it seems that the level of activity, dissemination and posting of information into their respective public folder could be increased This indicates a modest level conversion of tacit knowledge – knowledge in people's heads – into explicit knowledge and information Figure 6 roughly indicates the differentiation between active and passive members according to their level of participation and discussion within the Public Folders.

Specific co-ordination and co-operation between some Networks is already taking place, but it seems to be limited. Many efforts and initiatives from different Networks are underway, but it seems that further collaboration among them could be higher for mutual 'synergy' purposes and in order to take advantage of the benefits of sharing best practices and lessons learned between the more mature and newer Networks. A Knowledge Exchange Fair in May 2001 promoted greater interaction between the Networks and staff

Within the IDB Network co-ordinators, there is a significant level of awareness of the existence and work carried out by World Bank (WB) Thematic Groups (TGs). There is already some collaboration taking place. More than

Figure 6 *Members participation in Networks' MS-Outlook Public Folders*

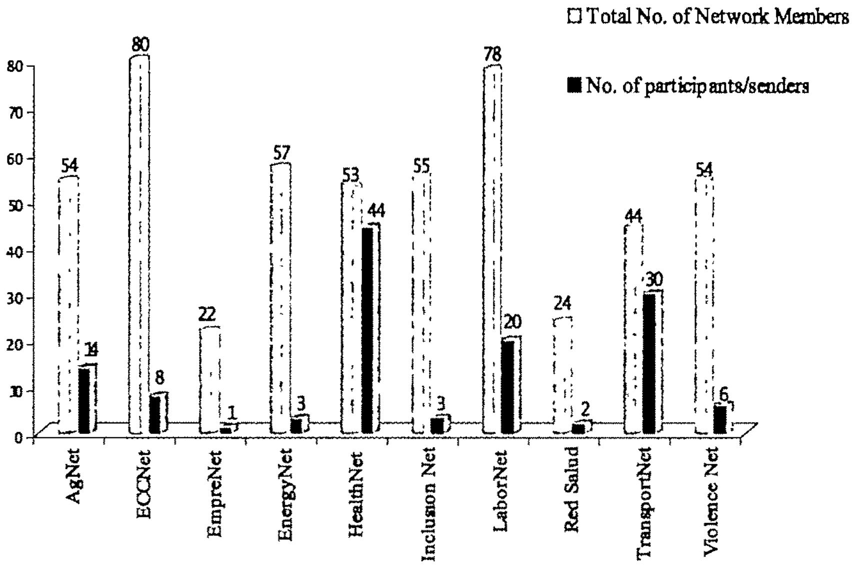
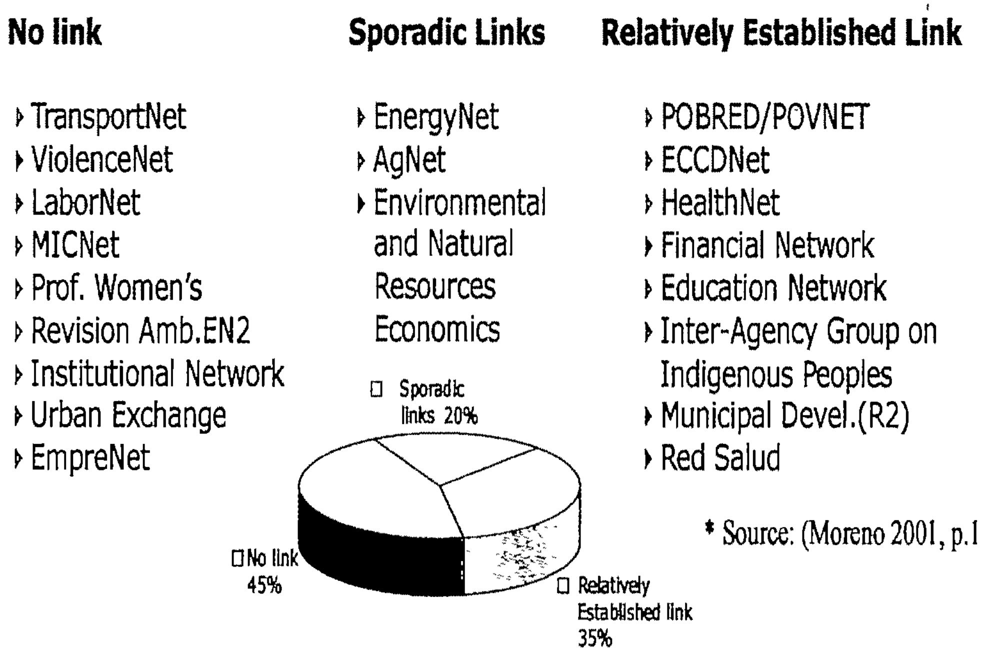


Figure 7 *IDE Networks and WB TGs connection*



No link

- TransportNet
- ViolenceNet
- LaborNet
- MICNet
- Prof. Women's
- Revision Amb.EN2
- Institutional Network
- Urban Exchange
- EmpreNet

Sporadic Links

- EnergyNet
- AgNet
- Environmental and Natural Resources Economics

Relatively Established Link

- POBRED/POVNET
- ECCDNet
- HealthNet
- Financial Network
- Education Network
- Inter-Agency Group on Indigenous Peoples
- Municipal Devel.(R2)
- Red Salud

* Source: (Moreno 2001, p.1

alf of the IDB Networks have established some orm of link with WB TGs (see Figure 7)

Several IDB staff members are well aware of nd are interested in the Global Development ateway (referred to as 'the Gateway') collaorative initiative, which aims to complement nd leverage the existing efforts of various embers of the development community everal Bank departments and units are lready involved with the Gateway, which curently includes the World Bank Group, memers of the public and the private sectors and ivil society groups.

Since the publication of an internal report Moreno, 2001), the IDB Networks are becomig more transparent within the Bank, lthough Network objectives, mission, memers, agenda and activities still remain implicit 1 most cases suggesting that Networks need o engage in marketing initiatives to promote nd enhance their activities within the Bank, ke the Knowledge Exchange Fair May 2001.

onclusions and recommendations

s in many other institutions and organisaons, the IDB faces both an interest and a conern regarding the extent to which it should upport the formation and development of the ank Networks. It has to be considered hether the proliferation of the Networks hould somehow be encouraged. It should be oted that most of them have clearly expressed hat they would welcome any kind of assisance and support that would strengthen their ctivities.

Most of the Bank's Networks are in the early tages of development Indicators have shown hat they function well on an informal basis. lowever, most of the Networks would require ome kind of support and recognition to be ven more effective and to promote participaon. As a result, knowledge exchange and the roliferation of the Bank Networks should not e taken for granted

Research and 'empirical' studies on knowldge exchange issues could help to identify riorities and lead to a more effective and straegic agenda for knowledge exchange initiaves. This could accomplish optimal and ffective performance of the group in order to hallenge the issues the Bank Networks aim to address. However, at all times, caution should be exercised to ensure maintenance of the natural dynamism and necessary autonomy of the Networks

IDB Networks should be considering and assessing the potential benefit of further increasing the integration of their information and knowledge sharing activities with the Bank's other activities, specifically project implementation. Members and co-ordinators could be given time and resources to more efficiently create and share community knowledge with others They should be given the time to increasingly participate and to bring added value to the discussions.

With some exceptions, current IDB Networks seem to be focussing and operating within institution boundaries. They should, as some Networks already have, start exploring the benefits of serving the needs of a broader group of communities and stakeholders, including partners in developing countries and executive agencies in borrower countries. It could be argued that the ultimate goal of most of the Networks should eventually be to relate to the outside partners

While the purpose of this study was to know more about the IDB's Communities of Practice, and not to interfere in any bureaucratic way with their existing activities, the IDB and many other organisations and institutions will need eventually to address some of the following issues.

- **Management support** Many elements in an organisational environment can foster or inhibit Bank Networks, including management interest, corporate culture and organisational policies, rewards and recognition. These factors do not necessarily determine whether people form and develop these communities, but they can definitively facilitate or hinder participation. Senior and middle management support and recognition (in terms of including knowledge exchange as an activity for purposes of time recording or Individual Performance Planning and Review) are among the most important factors in the success of knowledge exchange efforts and the proliferation of Networks In most cases, assistance and support, time-constraints and funding appear to be critical for Networks to succeed.

- **Resources and support funding** Although some Communities of Practice could be largely self-sufficient and may not require a formal budget, they would benefit from resources that would strengthen their Network activities. It is becoming more apparent that departments and units are allocating some budgetary resources to knowledge exchange initiatives. For instance the participation of 27 groups in the first IDB Knowledge Exchange Fair 2001, or the development of websites of some Communities of Practice
- **Networks leadership** The work and role of the Network co-ordinators/facilitators is extremely important to the extent that success currently depends to a great extent on the presence of one or more exceptional individuals that act as co-ordinators Thus, Networks creation and development ultimately depend on internal leadership In the long-term, Networks need to have a small group of champions who are willing to provide intellectual leadership and have a talent to facilitate and draw people in, without any pressure or animosity. The number of facilitators and co-ordinators per Network seems to be limited and they are only able to contribute limited time as a result of their regular responsibilities. Their superiors do not always recognise their work and efforts. This could be detrimental to the proliferation and development of a Network. Recognising and acknowledging the work of co-ordinators and Network members in their job performance evaluation and in 'Time Recording Systems' upon request could be highly beneficial.
- **Transparency** Sometimes, Communities of Practice remain unknown within the institutions, as was the case for most of the Networks at the IDB. Further, their objectives, mission, members, agenda and activities could also remain in most cases implicit At the IDB, co-ordinators see as a priority that basic information on these communities should be widely distributed and disseminated Bank-wide. This would create awareness within staff members and would help to identify the potential key players, makin sure that specialists are included
- **Activities and technology.** There is a widespread but uneven range of activities performed by Networks. Although there is thi variety, the volume of interaction could potentially and strategically be much highe The bottom line is that the range and intensity of activities and products will depen on the needs of the Networks, but the could also be constrained somehow by th technology currently being used. Techno ogy does not necessarily play a major rol in Networks. However, the use of ICTs is very important enabler for virtual communities IDB Networks need to ensure that recipients and partners can participate full in knowledge-sharing processes by identifying and assessing suitable collaborativ tools that would allow Networks with external partners (including non-IDB staff members) to increase the performance of thei knowledge/information exchange activities. However, it must be pointed out tha although these are key and necessary enablers, the implementation or installatio of technology alone to facilitate knowledge-exchange will not lead to widesprea sharing. Neither will making available information sources necessarily lead to thei use. What is critical is a cultural-behavioura change, which takes more time
- **Networking with counterpart' Communities** Differences in the level c formality and nature of these Communitie of Practice between any counterpart institutions are important. In the case of th IDB, collaboration is already taking plac between them However IDB Networks remain very informal and most of them are a an early stage. While there is enormous potential and natural demand for seekin further collaboration between IDB Networks and other international developmen partners (e.g. WB thematic groups and th Gateway), the challenge of formally incorporating external partners into IDB Networ co-ordinators and members resulting fron time constraints.
- **Minding the knowledge assets** KENS

TEER (Knowledge Exchange Network Steering Committee), whose *raison d'être* is focussed on strengthening knowledge exchange related initiatives at the IDB, currently represents all departments and is well qualified to help proactively in this endeavour, together with other groups and partners from the operational and support areas of the Bank. At all times, caution should be exercised to ensure the maintenance of the natural dynamism and requisite autonomy of the Networks

There is a general belief among Network articipants and members alike, that fostering ese Communities when necessary will sult in more rapid organisational learning, ore effective decision-making using lessons arned, and more rapid and effective problem lving. Circumstantial evidence shows that e Bank's Networks provide the opportunity add value to the participants and the stitution alike However, providing concrete roof of this appears to be a challenge at the oment Illustrative stories should be told hat must also not be overlooked is that the ersonal investment of Network members nd co-ordinators in these informal Networks in itself evidence that there are perceived enefits in this 'smarter way of working' that annot be ignored.

There is no one right approach to knowl- dge exchange, nor a universal approach to ifferent cultures. So, as many adopters and nowledge management practitioners would ay, it is best to experiment, stay flexible and ake changes 'on the fly' At the IDB, the npetus for setting up and supporting etworks should be bottom-up. A Network's fe-cycle is determined currently by the value provides to its members, not by an institu- onal schedule as may happen in similar insti- tions. These human communities are based n discourse, and their networked conversa- ons are enabling powerful new forms of ocial organisation and institutional knowl- dge exchange and learning to emerge

What type of formal structure or institu- onal recognition Communities of Practice in ny institution would need should be assessed nd determined. It will always be crucial to aintain diversity and flexibility in the approach to the Networks. Yet, the bottom line still remains the same Most organisations and institutions will first have to embrace cultural change by promoting and enhancing a knowledge sharing culture, where trust and empowerment of all employees would be an important issue.

It is evident that Networks at the IDB put the institution in an optimal situation to explore to a greater extent the benefits of knowledge exchange and leveraging of institutional knowledge principles. There is no doubt that these Communities of Practice are a remarkable and powerful example of knowledge exchange and of the fostering of the Bank's knowledge sharing culture

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amiliarity with and use of metadata formats nd metadata registries amongst those orking in diverse professional communities ithin the information sector

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Metadata registries are considered to be a solution to the problem of data sharing and standardising of information on the Internet. The International Organization for Information recognised the need for a standardised approach to this problem and produced ISO/IEC 11179 Information Technology - - Specification and standardisation of data elements. As part of an ongoing research project on the ISO/IEC 11179 metadata registries implementation a questionnaire survey was carried out on four discussion lists and the EU funded SCHEMAS 2nd workshop (23-24th November 2000). Results from this survey, which was essentially aiming to identify how familiar people were with metadata and metadata registries, are presented along with a brief introduction to the ISO/IEC 11179 Information Technology – Specification and standardisation of data elements standard.

ntroduction

fundamental characteristic of the 'informa- on revolution' is the availability of lots of free nformation to anyone with a computer, a net- ork connection and some basic computer lit- racy skills The downside of all this is nformation overload, extraneous information, tc These matters have been widely discussed Wilson, 1996, Reuters Studies, 1996, 1997). It as soon recognised that in order to be able to cate, access and retrieve information of inter- st from the exponentially growing informa- on pile that is the Web it would have to be rganised and managed.

Libraries are the institutions that are tradi- onally associated with the organisation of nformation Library practices such as catalo- uing, indexing, abstracting, and classifying ave been applied to large data sets for years hese practices are based upon agreed rules nd codes that refer to the syntax, semantics nd the structural form of the resource escribed In time they have grown to sophisti- ated standards and the library community as succeeded in dealing with the problems associated with preservation, maintenance, and exchange of information. Libraries have a longer tradition in the production and exchange of information in electronic form than any other organisation in the bibliographic information chain (Dempsey, 1989). But of course nothing has been tackled on the scale of the Web and they have played only a minor role in the Web's actual development Nevertheless, Baker (1996) acknowledges that 'the Web must become more like a well-organised library'. And Lynch (1997) also quotes that:

> In short, the Net is not a digital library But if it is to continue to grow and thrive as a new means of communication, something very much like traditional library services will be needed to organise, access and preserve networked information

The development of metadata formats has been raised as a method to provide for the description and efficient retrieval of information.

> The effective management of networked digital information . will increasingly rely

on the effective development and use of systems that can collect and use appropriate metadata (Day, 1999).

Since the first Dublin Core Workshop that initiated the 'metadata movement' (Baker, 1999) in 1995, rapid advances have been made. Implementations carry on side by side with research. Metadata appears to provide an effective answer to discovering and retrieving networked information (Dempsey, 1996, 2000; Dillon, 2000)

Woodward (1996) and Vellucci (1998) provided the coverage of literature on metadata starting from 1990 to 1998; Milstead and Feldman (1999) completed those studies by providing an overview of emerging projects on standardisation of electronic resources Heery (1996) and Caplan (2000) have produced a description and comparison of some metadata formats A successful example of the use of metadata for resource description that facilitates efficient resource discovery is the Subject Based Information Gateways (Depsey, 2000, National Library of Australia, 1999; RENARDUS project)

Research on metadata registries seems to be in its very early stages. The UK Office of Library and Information Networking (http://www ukoln.ac.uk/metadata), University of Goettingen (http://www sub uni-goettingen de/nojava_home-e htm), the Australian Institute of Health and Welfare (http // www.aihw.gov.au/knowledgebase/index html), and the US Environmental Protection Agency (http://www.epa.gov/edr/) have been actively involved in the development and implementation of metadata registries Metadata registries are registration authorities associated with the description, discovery, storage and exchange of metadata and they aim to address the problem of data sharing and standardisation of networked resources.

Aims and objectives

The aim of the survey reported here was to find out how familiar interested parties from different professional communities were with metadata in order to identify how the interest manifests itself and to obtain feedback on their thinking regarding metadata registries Our objectives were:

- To discover what metadata means to peopl from the diverse professional communitie involved in the information chain.
- To identify the most popular metadata formats in terms of publication and use and t investigate the reasons why these format are used.

In relation to metadata registries the specifi objectives were:

- To identify whether the concept of metadata registries is fully understood and acknowledged and to raise the question o registry deployment
- To identify the most popular metadata registries in terms of publication and use within different sectors and find out the reason for using them.
- To discover which sectors are more likely t have a requirement for a metadata registry

This paper is part of an ongoing researc project at City University on the use and functionality of ISO/IEC 11179 metadata registr implementations.

Scope and definitions

For the purposes of this paper the followin definitions have been adopted and employe throughout

- *Metadata.* 'Structured data about data' (Weibel, 1997).
- *Metadata Format.* 'The format is a set of rule that govern the data structure and content (Hopkinson, 1998)
- *Metadata Schema.* 'A structured set of attributes with associated semantics and nam elements' (UKOLN, a combined definitio from RLSP project and SCHEMAS glossary)
- *Metadata Registry* See Literature revie section, Definitions, for details.
- *Interoperability* 'The ability of two or mor systems or components to exchange information and to use the information that ha been exchanged' (IEEE, 1990).

Literature review

Research on metadata as a mean for describin networked information resources that woul facilitate efficient retrieval has been widely discussed at an international level. A recen earch of the EU Cordis database[1] revealed 47 esearch projects on metadata associated vith the description, organisation and retrieval f information. There is also the expansive list hat the International Federation of Library ssociations and Institutions (http://www i-a.org/II/metadata.htm) maintains on meta-ata links to conferences and workshops that ave taken place since 1997, including those rganised by the IEEE and ACM on Digital ibraries. Information about the Dublin Core letadata Initiative Workshop Series that itiated the 'metadata movement' in 1995 can e found at the DCMI website (http://dublin-ore org).

As mentioned earlier, metadata attracts ttention from a wide range of very different ommunities, so there is no homogenous pproach towards it. Metadata means different ings to different people Heery, Powell and ay (1997) illustrate the different stances aken by computer scientists and information cientists·

> The unit being described would be a data element in computer science, and a resource in the information world In the information world metadata may consist of an agreed set of data elements with agreed semantics, agreed syntax and agreed rules for formulating the content of the elements.

Widespread interest has led to the develpment of several metadata formats and itiated several conferences (IEEE 1996-99; CM DL 1996-00) and workshops (DC 1995-0, EU 1997-99, DELOS 1996-99) for people to iscuss advances and exchange experiences. was clear that in order to be able to exchange formation there should be some agreement n issues related to interoperability, retrieval, ltering, electronic commerce, user interfaces mong others.

The concept of registries grew out of the eed to develop registration authorities that ould provide a solution to the interoperability roblem among the diverse disciplines The roblem as put by Baker (1996), was 'how to integrate access to a broad variety of Web resources without assuming that they sacrifice their customized catalogs, format preferences, or institutional autonomy' Miller and Johnston (UK Office for Library and Information Networking) of UKOLN hosted Interoperability Focus distinguish among technical, semantic, political/human, inter-community and international interoperability (http.//www ukoln.ac.uk/interop-focus/about/). The International Standards Organization recognising the level of interest proceeded to the development of the ISO/IEC 11179 Information technology - - Specification and standardisation of data elements

ISO/IEC 11179. Information Technology - - Specification and standardisation of data elements

The improvement of international Internet communication among governments, businesses, and scientific communities is dependent on the successful application of the ISO/IEC 11179 Standard (see ISO/IEC 11179 Standard) ISO/IEC 11179 is an international standard that consists of six parts It concerns Information technology - - Specification and standardisation of data elements and its parts refer to·

Part 1· Framework for the specification and standardisation of data elements
Part 2. Classification for data elements.
Part 3· Basic attributes of data elements
Part 4· Rules and guidelines for the formulation of data definitions.
Part 5: Naming and identification principles for data elements.
Part 6. Registration of data elements.

Part 3, which refers to the basic attributes of data elements, was the first part of the standard to be created back in 1994 and at the time of writing all six parts of the standards are under 90.92 code which means that they are to be revised. The problems that ISO/IEC 11179 addressed were those of data sharing and standardisation (IEEE Metadata Conferences 1996, 1997, 1999; EU Metadata workshops 1997, 1998, 1999, DC Workshop Series from 1995-2000; ERCIM/DELOS Working Group Reports 1996, 1998).

European Commission Community Research & Delopment Infpormation Service (CORDIS) Available http.//www.cordis lu

While standardisation regarding data elements is still under the microscope, ISO/IEC 11179 aims to act as one of the four components of the Open Systems Interconnection Environment (OSIE). OSIE is meant to be the 'space' within global electronic communications among diverse computer hardware and applications could share information (see ISO/IEC 11179 Standard) The other three components are hardware, software and communications.

ISO/IEC 11179 denotes that for data to be shareable it must be based on a common understanding among those who create it and those who use it. It proposes the establishment of a data element registry and gives guidance on how to classify, describe, name, identify and maintain both the data element descriptions and the metadata that are going to be used to configure those data elements.

Role – Functionality of metadata registries

Metadata registries are tools that enable the management of the semantics of data. That is vital for the consistency and coherence of information stored and shared among databases The role of a registry is:

- To support data standardisation and data documentation.
- To support the management of basic semantics.
- To function as an authoritative source of reference information about data
- To act as a medium for recording and disseminating data standards
- To function as a 'mediator' to the actual source of information.

Metadata registries that are based on the Standard are partly (Part 3) based on the X3.285 1999 standard that refers to the Metamodel for the management of shareable data which provides a logical model for a computer system. This standard though provides the conceptual model for the structure of a registry allowing implementers to alter structure and functionality according to needs. (See ISO/IEC 11179 Standard. Parts 1-6)

Functionality of currently implemented metadata registries refers to.

- Data exchange (EDR, Knowledgebase, SCHEMAS)
- Description of text resources (EDR)
- Seeing definitions and usage of elements (DESIRE; MetaForm; EDR; Knowledgebase; SCHEMAS)
- Finding out about dictionary structures (EDR; Knowledgebase);
- Seeing mappings between different formats (DESIRE; MetaForm; EDR; Knowledgebase; SCHEMAS)

Definitions

Although Part 3 of ISO/IEC 11179 was created in 1994 and the development of the other parts has been continuous and coherent, the implementation of metadata registries has been slow to get off the ground and there still is yet to be a meeting of minds amongst the major national bodies. In Europe research on registries has been conducted by the UK Office for Library and Information Networking (UKOLN) mainly through the EU funded R&D projects DESIRE I, II, ROADS and SCHEMAS and by the University of Geottingen with MetaForm Respectively, they define metadata registries as:

> . . formal systems that can disclose authoritative information about the semantics and structure of the data elements that are included within a particular metadata scheme. (http://www.desire.org/html/research/deliverables/D3.5/)

> Metaform is a database for metadata formats with a special emphasis on the Dublin Core and its manifestations as they are expressed in various implementations. This service is part of the META-LIB Project (Metadata Initiative of German Libraries) As a project deliverable, the idea behind this database is to identify the core elements that are used for the description of networked resources. (http://www.sub.uni-goettingen.de/nojavahome-e.htm)

In the USA a forum has been established the ISO/IEC 11179 Metadata Registry Implementation Coalition, which aims to form the basis for the discussion of issues related to the implementation of metadata registries The White Paper for Federal Agency CIOs and architects, March 1999, defines metadata gistries as

> Data semantics management systems, or data element concept metadata registries as they're also called – the terms can be used interchangeably – are automated databases that contain all of the information that defines the exact meaning of the individual terms and data elements, including the semantic relationships between different data elements and different terms.
> (http://hmrha.hirs.osd mil/mrc/WhitePaper html)

In Australia research and implementation of a metadata registry is supported by the Australian Institute of Health and Welfare and defined as: '...an electronic storage site for Australian health, community services, housing and related data definitions and standards, and includes a powerful query tool' (http://www.aihw.gov au/knowledgebase/aboutkb html)

Recently (20 May 2001), the DCMI Registry orking Group (Guinchard, 2001) published e 'Purpose and Scope of the DCMI registry' ttp.//dublincore org/groups/registry/pur- se-20010511 shtml) which is defined as:

> ...a database of RDF schemas that provides registration, navigation and reuse of semantics defined by various resource description communities
> (http.//wip.dublincore org·8080/registry/jsp/registry.jsp)

ethodology

e principle medium for gathering informa- n for the study was a questionnaire that was itially designed for distribution at the EU nded SCHEMAS 2nd Workshop. The question- ire was included in the delegates' pack with note to be returned at the registration point the workshop when completed. The number the workshop attendees was limited to 50 irteen people completed the questionnaire. slightly different version of the questionnaire hich included one more question)[2] was addi- nally posted to several discussion lists ming to gain a more worldwide response m a wider range of information communities. In this respect it was posted to four discussion lists[3] between the 12th and 15th of November 2000 and allowed for a two week period to complete and return the questionnaire. The number of people that responded from the discussion lists was 53. The membership figures for two of these lists – which overlap – were made available to us

Interoperability = 385 members on 14th November 2000
UK-meg = 90 members on 14th November 2000

The overall response from all four discussion lists and the SCHEMAS workshop attendees was 66 people representing respectively the following industry sectors: (see also, Figure 3):

- Industrial Sector, 8% of overall response
- Publishing, 3% of overall response.
- Educational, 15% of overall response.
- Academic, 37% of overall response
- Research, 17% of overall response.
- Other Sectors, 20% of overall response.

Although the numbers of people are relatively small in regard to the potential population of interested parties it is believed that the response we obtained provides a major insight into what people feel about metadata and metadata registries.

The questionnaire consisted of three parts. The first part asked for personal details of the

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[2] The same questionnaire was actually sent to all but as a result of a mistake in the distribution at SCHEMAS they gave out a previous version of the questionnaire that excluded part 2 question 2 that refers to metadata terms

[3] The discussion lists were, (last visited 12 June 2001)

- 11179 Metadata Registries Coalition Discussion list (US-based list) Information available at http // hmrha hirs osd.mil/mrc/
- Diglib (IFLA hosted list regarding Digital Libraries Information available at· http //www ifla.org/II/lists/diglib htm
- UK-Meg (JISCMAIL hosted list regarding Metadata for Education) Information available at http // www jiscmail ac uk/lists/uk-meg html
- Interoperability (JISCMAIL hosted list regarding Interoperability). Information available at. http.// www jiscmail ac uk/lists/interoperability html

respondents, such as age, sex, sector[4] that they represented and the post held. The second part of the questionnaire consisted of seven questions referring to metadata in general and aimed to gather information regarding familiarity with a range of terms associated with metadata. Also, to identify metadata formats that respondents recognise and have used and to investigate the reasons why these formats were used. The third part of the questionnaire consisted of seven questions referring to metadata registries and aimed to identify whether the concept of metadata registries is understood and acknowledged and to raise the question of registry deployment. Also, to identify the most popular metadata registries in terms of publication and use within different sectors and find out the reasons for using them and to discover which sectors are more likely to have a requirement for a metadata registry[5].

Background on the discussion lists follows

- The Discussion Lists (information adopted from their websites, see foonote 1).
  11179 Metadata Registries Coalition Discussion list Information available at· http://hmrha.hirs osd.mil/mrc/
  Formed in 1998 and aims to 'provide a forum and source of practical experience for mutual co-operation among organisations that are introducing metadata registries into their information systems asset base in order to be able to manage the semantics of the data elements in their databases'. Members include people from diverse communities with an interest in ISO/IEC 11179 Standard implementation approaches, developments and support.
- **Diglib (IFLA hosted list regarding Digital Libraries).** Information available at http //www.ifla.org/II/lists/diglib.htm
  Formed in 1995 and it is '. . . a mailing list i for librarians, information scientists, an other information professionals to share information about the many issues and technologies pertaining to the creation o 'digital libraries'.' Members include ' . individuals and organisations from around th world who are creating or providing electronic access to digital collections to participate in knowledge sharing about curren developments in digital library research.'
- **UK-Meg (JISCMAIL hosted list regard ing Metadata for Education List).** Information available at: http / www.jiscmail.ac.uk/lists/uk-meg html
  Formed in June 2000 and aims to '. . support the work of the Metadata for Educatio Group (MEG), which seeks common approaches to the description and exchang of educational content across all levels c the UK's educational system . . .' Member include '. . . a number of the current player in this field, drawn from primary, secondar tertiary and continuing education, as we as from relevant standards initiatives an the museum and library sectors, whic have valuable content to offer.'
- **Interoperability (JISCMAIL hosted lis regarding Interoperability).** Informatio available at. http://www.jiscmail.ac.uk lists/interoperability.html
  Formed in January 1999 and aims to addres issues '. . including metadata, distribute library systems and public library networking Interoperability Focus also has a special interest in moving beyond the librar sphere, specifically encompassing museums, archives, and other aspects of th cultural heritage, as well as Governmen and community information.' Members include 'Projects and individuals with exper ences to share, working implementation to show, or core issues to resolve whic might usefully be addressed by Interoperability Focus, are invited to get in touch.'
- **Schemas Workshop.** Information avail

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[4] The grouping of sectors was based on the SCHEMAS First Metadata Watch Report (May 2000) Available at· http //www schemas-forum org/metadata-watch/ 1 html (last visited 12 June 2001) as the questionnaire was originally designed for distribution at the 2nd SCHEMAS Workshop 23-24 November 2000, Bonn

[5] This questionnaire is part of a wider research on metadata registries and it aimed to act as a pilot study regarding people's awareness of issues referring to metadata and metadata registries and locate people, projects and interest for further investigation regarding registries

able at: http://www.schemas-forum org/workshops/ws2/schemas-ws2 html

two day workshop that took place between he 23-24th of November 2000 in Bonn, ermany. The theme of the workshop was ublishing and sharing your application proile' and its aim was 'to present the state of the rt in constructing and publishing an applicaon profile and how it may be declared in ML/RDF, especially in the light of new metada harvesters that support the indexing and rowsing of standards and application profiles ocated on multiple Web servers.'

esults

haracteristics of population

he total response was sixty-six completed uestionnaires from four discussion lists and elegates at the 2nd SCHEMAS Workshop. The ighest response rate came from Diglib (32% f overall response) followed by SCHEMAS 20%). 17% of respondents did not state from hich list they obtained the questionnaire Figure 1).

Men and women were equally represented mongst respondents (Figure 2). Figure 3 hows that people aged between 25-34 (33% f overall response) and 45-54 (29%) were in e majority. The highest response rate among dustry sectors came from the academic ector (37%) followed by the 'other' category 20%). See Figure 4 for more details. The other ategory included the following sectors:

Government (8)
Consulting (3)
Natural resource information management sector and (1)
Cultural Heritage (1)[6]

No response was obtained from the audiosual and geographic information sectors and nly two people represented the publishing ector[7]. In connection with occupational background, most respondents were information cientists (44%), 18% were computer scientists nd 6% consultants (Figure 5). The 'other' category accounted for 26% of respondents and cluded such occupations as university proessors, project officers, a private contractor to ublic land agencies, a researcher and a erson responsible for the Library and Training elations of a company.[8]

Metadata terms

We wished to discover the extent to which there was still a wide and ambiguous terminology associated with metadata. Also whether the various groups were using a different vocabulary Thus although 'schema, schemas, schemata', 'format, formats' and 'element sets' are quite often used to denote the same thing (metadata formats is the term we use) The first one is mainly associated with XML, RDF and used with a different meaning than metadata format which tends to be used by the computer industry (http://www.w3 org/WAI/GL/2000/12/unified-glossary.html#Glossary for a definition) 'Metadata systems' is a term commonly used in the commercial, industrial sector Figure 6 shows what our survey uncovered The most common terms used when referring to metadata are schemas and standards (20% recognised them), followed by element sets (19%) and formats (16%)[9]

Out of the 66 respondents who had come across a metadata format in the past 54 (82%) had also used one or more of these formats Metadata formats that respondents most often came across in their work were in order of occurrence Dublin Core (94%) and MARC

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[6] Although Libraries, Museums, etc tend to be filed under the Cultural Heritage Sector for the purpose of this study they have been filed under the Academic Sector A distinction has been made for Cultural Heritage since this person did not specify its occupation

[7] It should be noted that research (http//www schemas-forum org/metadata-watch/) in both sectors, particularly the geographic information sector indicate active involvement in the development of metadata standards, formats and schemas and this non response seems to be misleading as for activities in the area

[8] Response to this question varied and the grouping of people was divided into IS and CS taking as a criterion their professional background as most respondents are involved in Digital Libraries, Metadata, Projects Management Category 'Other' consists of researchers, professor, a private contractor, and officers

[9] The findings in this question do not include response from SCHEMAS as this question was not included in the questionnaire distributed to the workshop The questionnaire that was distributed to the participants of the workshop did not include all options of the same question of the questionnaire that was distributed to the members of the discussion lists

Figure 1 *Origin of respondents*

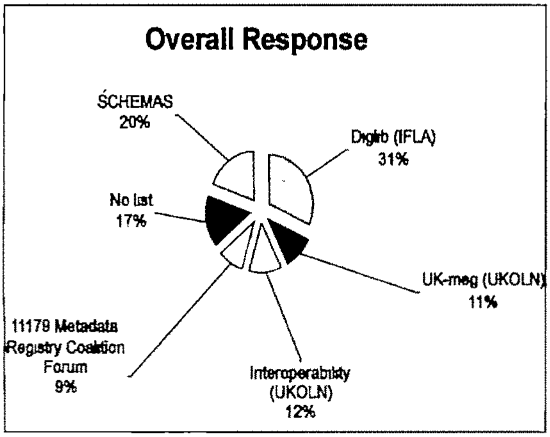


Figure 2 *Response rate by sex*

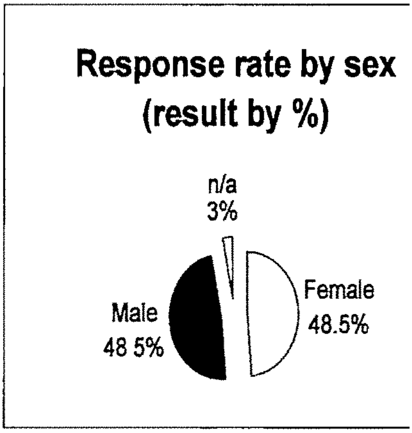


Figure 3 *Response rate within age groups*

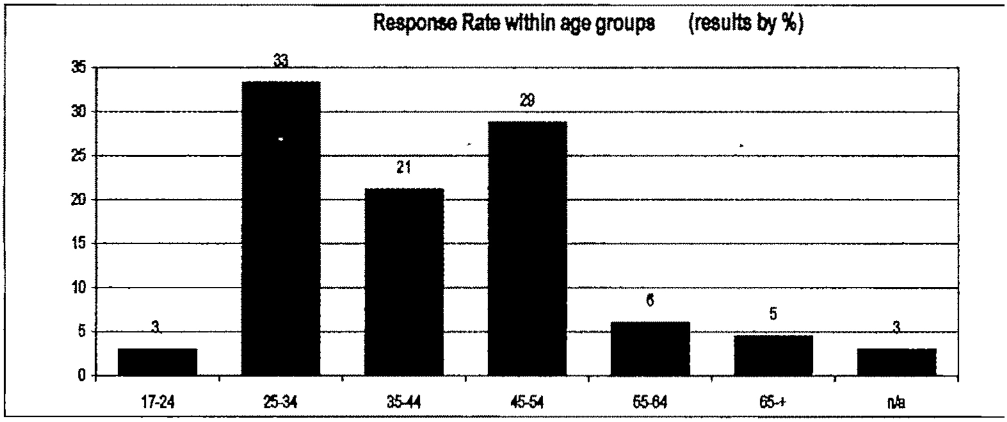


Figure 4 *Response rate by industry sector*

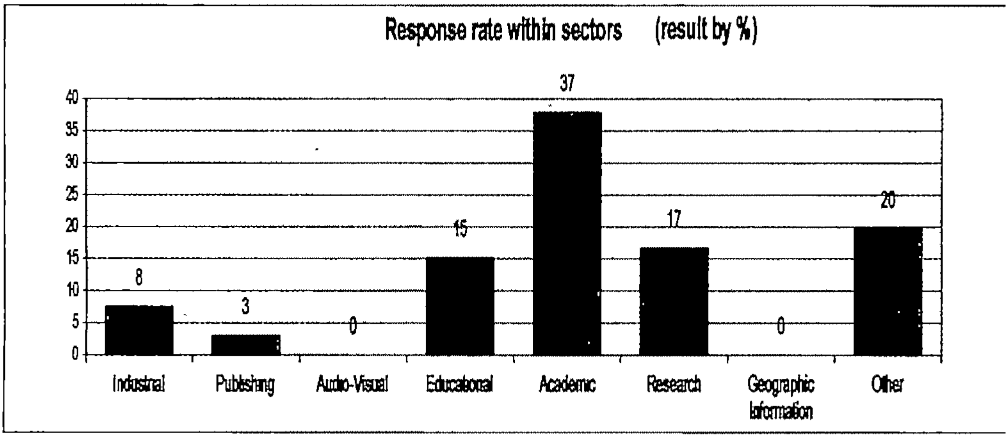


Figure 5. *Response by occupation*

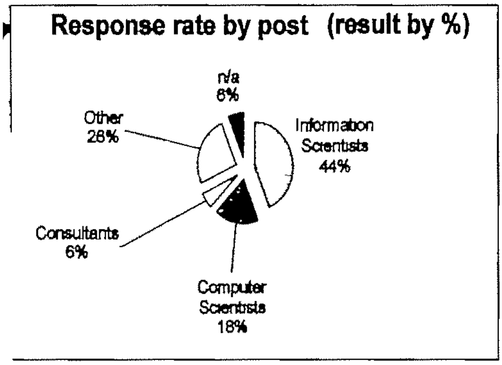
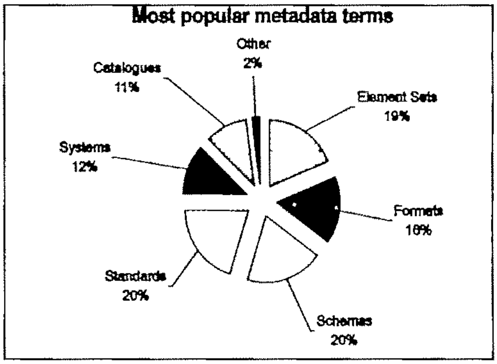


Figure 6 *Metadata terms*



83%). See Table 1 for more details. They also stayed in this order when questioned about he formats most used by the 82% of respondents who had come across metadata – at 78% and 50% respectively. Results for use of metadata formats within each sector are presented in Table 2. Respondents said that the reasons for using a metadata format were that it was a requirement of the project that they were working on (70%) and to describe the Library's Resources (41%). See Figure 7 for details Projects ranged from the development of a metadata encyclopaedia to the description of digital image collections and resources for a Subject Based Information Gateway.

Metadata registries

Unlike metadata that all respondents were familiar with, registries are still relatively unknown. Twenty-two of the respondents (33% of response) appear to have never heard of

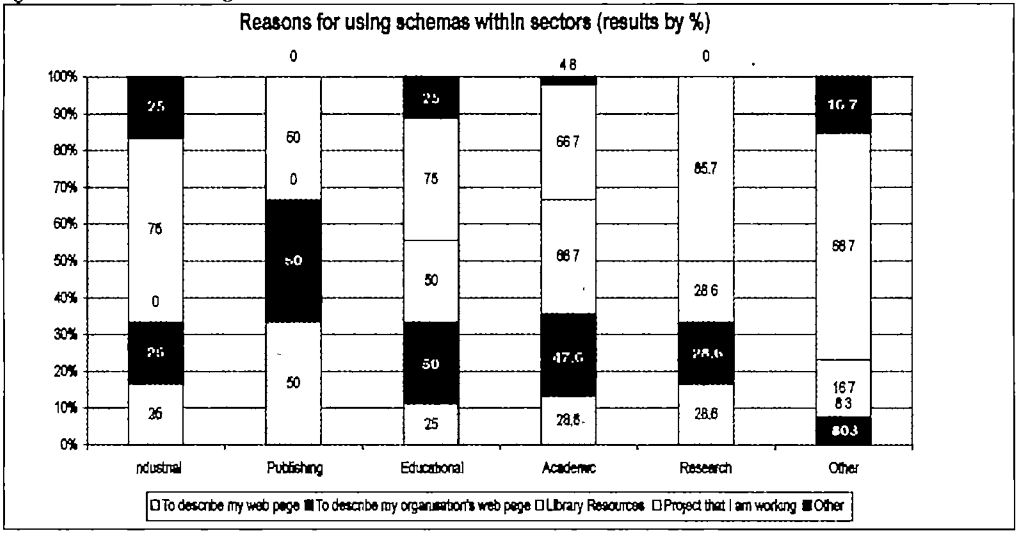
able 1. *Schemas most heard of within sectors*

Schemas most known (result by %)	Industrial	Publishing	Educational	Academic	Research	Other
Dublin Core	60	50	90	100	100	100
IEEE LOM	0	0	50	52	36	31
MARC	80	50	80	92	82	77
IMS	0	0	50	68	18	46
GILS	20	0	60	56	45	69
Other	40	0	60	44	9	54

able 2 *Schemas most used within sectors*

Schemas most used (result by %)	Industrial	Publishing	Educational	Academic	Research	Other
Dublin Core	50	50	88	95	71	58
IEEE LOM	0	0	13	14	14	17
MARC	50	50	38	76	43	17
IMS	0	0	13	19	0	8
GILS	0	0	0	10	0	25
Other	25	0	63	33	43	42

Figure 7 *Reasons for using schemas withinsectors*



metadata registries before and only 16 (24%) have used one Table 3 shows that the most familiar registries were DESIRE (73%) and ROADS (64%) followed by indecs (43%) and Knowledgebase (39%). The 16 respondents who have used a metadata registry noted their preference for ROADS and MetaForm followed by EDR and DESIRE (Table 4) Figure 8 shows the main reasons for using a metadata registry by respondents of the four discussion lists[10] were to 'find out about definitions of elements' and to see 'dictionary structures' (70% each). These were followed by 'finding out about mappings among different schemas' and 'describin text resources' (50% each) Workshop participants indicated that reasons for using a metadata registry were to 'find out about mappings (100%) and for 'resource description/find ou about relevant information' (60%) When asked whether their organisation had a requiremen for a metadata registry (Table 5) 32% of respondents replied 'No' while 27% replied that they 'don't know'; only 23% of the respondents replied that their organisation had a requirement for a metadata registry.

Table 3 *Registries most known within sectors*

Registries most known (result by %)	Industrial	Publishing	Educational	Academic	Research	Other
Indecs	**0**	**0**	**43**	**53**	**60**	**11**
DESIRE	**0**	**0**	**71**	**88**	**80**	**44**
ROADS	**0**	**0**	**86**	**82**	**60**	**22**
MetaForm	**0**	**0**	**14**	**35**	**20**	**0**
EDR	**0**	**0**	**14**	**18**	**10**	**44**
BSR	**0**	**100**	**29**	**12**	**10**	**44**
Knowledgebase	**100**	**100**	**43**	**18**	**20**	**78**
Other	**100**	**0**	**14**	**29**	**20**	**33**

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[10] The questionnaire that was distributed to the participants of the workshop did not include all options of the same question of the questionnaire that was distributed to the members of the discussion lists

Table 4 *Registries most used with sectors*

Registries most used (result by %)	**Industrial**	**Publishing**	**Educational**	**Academic**	**Research**	**Other**
Indecs	**0**	**0**	**0**	**0**	**0**	**0**
DESIRE	**0**	**0**	**0**	**33**	**100**	**0**
ROADS	**0**	**0**	**100**	**67**	**50**	**0**
MetaForm	**0**	**0**	**0**	**67**	**50**	**0**
EDR	**0**	**0**	**0**	**0**	**0**	**80**
BSR	**0**	**100**	**0**	**0**	**0**	**20**
Knowledgebase	**0**	**0**	**0**	**0**	**0**	**40**
Other	**100**	**0**	**100**	**0**	**0**	**40**

Figure 8 *Reasons for use within sectors (discussion lists only)*

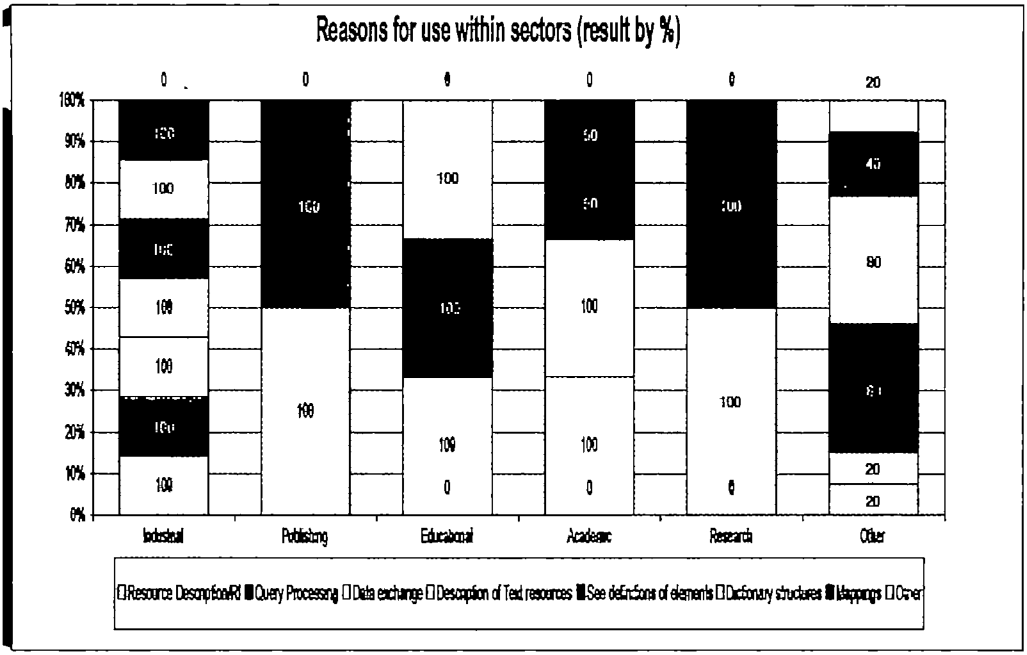

Table 5 *Requirement for a registry within sectors*

Requirement (result by %)	**Industrial**	**Publishing**	**Educational**	**Academic**	**Research**	**Other**
Yes	**20**	**50**	**30**	**20**	**36**	**8**
No	**0**	**0**	**50**	**24**	**27**	**54**
I don't know	**40**	**0**	**10**	**36**	**27**	**23**
n/a	**40**	**50**	**10**	**20**	**9**	**15**

Sectorial differences

Industrial

Five people replied representing 8% of respondents 60% of respondents were computer scientists. The most popular terms associated with metadata were schemas and standards (100% each) followed closely by element sets and formats (80% each, please see footnote 7) The most popular metadata formats were MARC (80%) and Dublin Core (60%). The main reasons for using these metadata formats were for the projects people were involved with (75%) and to describe web pages – either personal (25%) or organisational (25%). 80% of respondents had never heard of metadata registries before. The one person who was familiar with registries had only heard of Knowledgbase and a registry, which that person had developed and was using with the clients of the company that they represented. Reasons for using that registry included all those stated in the questionnaire. This respondent was the only person who mentioned that the organisation that he represented had a requirement for a registry, while half of the other respondents replied 'No' and the other half said that they 'Don't know' if their organisation has a requirement for a registry.

Publishing

Two people replied representing the 3% of respondents One of them did not say what post he held and then said he was employed in the 'library and training relations' department of the organisation in which he worked The most popular terms associated with metadata in the publishing sector were element sets and formats (100% each, please see footnote 7). The most popular metadata formats were Dublin Core and MARC (both 50%) Reasons for using these metadata formats were to describe web pages – both personal (50%) and organisational (50%) and for the project that one of the respondents was involved in (50%, EULER). Both respondents said that they were familiar with metadata registries and the most popular were Knowledgebase and BSR. BSR is the main registry that they have used and reasons for using it were for 'Resource Description/Find relevant information' and for 'Query processing' The organisations that they represented had a requirement for a registry but neither specified as to why.

Educational

Ten people replied representing 15% of respondents. 40% of the respondents were computer scientists, 30% information scientists and 30% selected the category 'Other'. The 'Other' category included project officers and a professor The most popular terms associated with metadata were schemas (100%), element sets, formats and standards (88%) (please see footnote 7). The most popular metadata formats were Dublin Core (90%), MARC (80%), GILS (60%) and 'Other' formats (60%). 'Other' formats included EAD, TEI Lite, AGLS, EdNa, RSLP Dublin Core is the most used format in this sector (88%) Reasons for using these metadata formats were for the projects the respondents were involved in (those included metadata and users' profiles, navigation for department's use, records management projects) followed by using them to describe resources on the organisational web page and library resources (both 50%). 70% of educational respondents said they were familiar with metadata registries and the most popular were ROADS (86%), DESIRE (71%), indecs (43%) and Knowledgebase (43%). Only 10% of those in the educational sector had used a registry and those used were ROADS, BSI and govtalk. Reasons for using them were to find out about 'Dictionary Structures', 'See definitions of elements' and for 'Description of text resources'. 50% of respondents replied that the organisation that they represented did not have a requirement for a metadata registry. 25% of respondents replied that the organisations they represented had a requirement for a metadata registry and specified what kind of requirement 'all those stated in the questionnaire' and to 'ensure that controlled vocabulary lists are used'.

Academic

Twenty-five people replied representing the 37% of respondents 84% of the respondents were information scientists. Computer scientists, researchers and 'Others' were equally represented (4% each). The most popular terms associated with metadata in the academic sector were standards (95%), followed by schemas (85%) and element sets (80%) (please see endnote 9). The most popular metadata formats were Dublin Core (100%) and MARC (92%) and were also the formats most used. It should be mentioned the number of 'Other' (33%) formats that includes CCF, EAD, TEI, and FGDC. Reasons for using those metadata formats were for the projects respondents were involved in (these included digital image collection, digital libraries projects, etc.) and to describe library resources – both 67% each. 68% of the academic respondents were familiar with metadata registries and those most popular were DESIRE (88%), ROADS (82%) and indecs (53%). 24% of the academic sector had used a registry in the past and those used were ROADS and MetaForm (67% each), followed by DESIRE (33%). Reasons for using the registries in order of preference were for 'Data exchange' and 'Description of text resources' (33% each), followed by 'See definitions of elements' and 'Find out about mappings'. 36% of the academic sector replied that they do not know if the organisation they represented had a requirement for a metadata registry. 24% replied that the organisations that they represented did not have a requirement for a metadata registry 20% did not answer the question and 15% replied their organisations had a requirement for a metadata registry specifically in terms of 'register(ing) additions to LOM' and 'to describe material which we are collecting and archiving as part of a 'proof of concept' for digital preservation'

Research

Eleven people replied representing 17% of respondents. Responses came from information scientists and researchers (27% each). 18% did not say what they were. The most popular terms associated with metadata were element sets and standards (100%), followed by schemas (86%) (please see footnote 7). The most popular metadata formats were Dublin Core (100%) and MARC (82%) and were also the formats most used at 71% and 43% respectively The 'Other' formats used (43%) included Browsable Corpus-MPI' and 'own schema'. Reasons for using these metadata formats were the projects people were involved in (only one of the respondents specified the project working for, EASEL) and to describe resources on the organisational web page 91% of those representing the research sector were familiar with metadata registries and the most popular were DESIRE (80%) followed by indecs and ROADS (60% each). As with most sectors only 18% of the respondents had used a registry in the past and those used were DESIRE (100%), ROADS and MetaForm (50% each) Reasons for using them were to 'Find out about mappings' and 'See dictionary structures' 36% of the respondents replied that their organisations had a requirement for a metadata registry but except for one person who specified that 'BSR will be used for (the) EASEL (project)' the others did not specify what this requirement was. 27% replied that either they 'Don't know' if the organisation that they represent has a requirement or that it does not have a requirement for a metadata registry.

Other sectors

Thirteen people replied representing 20% of all respondents. Other sectors included consulting, government and natural resource information management. 38% of the respondents were information scientists, 23% computer scientists and consultants and 15% selected the 'Other' category 'Other' included a private contractor to public land agencies and a 'developer' The most popular terms associated with metadata in other sectors were element sets (92%) and formats (67%) (please see footnote 7) The most popular metadata formats were Dublin Core (100%) and MARC (77%) followed closely by GILS (69%) In terms of the formats most used Dublin Core (58%) remained the most popular while 'Other' formats follow at 42% Other formats included AGLS, FGDC and 'Schemas in EPA and Beta MetaPro' The primary reason for using these metadata formats were for the projects respondents were involved in (these included a metadata encyclopaedia, preparation of help files for a wizard[1]). 69% of the respondents were familiar with metadata registries Knowledgebase (78%) was the most popular among them followed by EDR and BSR. 38% had used a metadata registry in the past. EDR (80%) was the one most used and was followed by Knowledgebase and other registries (40%), which included SMMS and USHIK. Reasons for using registries were to 'See definitions of elements', 'Dictionary Structures' followed by 'Find out about mappings'. 54% of the respondents said that the organisation they represented did not have a requirement for a metadata registry.

Conclusions

The highest response came from the academic sector where 25 people (37% of respondents) replied to the survey Although there is quite a spread of response over the various industry sectors it should be noted that results should be treated with care as they are biased towards the academic sector.

One of the proposed solutions to the interoperability problem is forming authoritative registration spaces Initiatives towards that direction include the establishment of the standard to guide implementation of registries Although at this point metadata registries are not widely deployed there are indications that they will be in the future. From our attempt to find out about people's awareness on metadata and metadata registries the following conclusions can be made.

- Metadata appears to be widely known and used within the respondents of the lists and the attendees of the SCHEMAS workshop.
- The most popular terms associated with metadata were 'schemas', 'standards' and 'element sets' although the list does not stop there. As put by one of respondents 'Not sure where you want me to stop'.
- Dublin Core and MARC were the most popular formats both in terms of familiarity and usage. The main reasons for using metadata appears to be the 'project that the user is working for', indicating a wide range of projects associated with metadata such as: 'A metadata encyclopaedia', 'Digital image collection', 'Training village database of learning resources' to the 'National Curriculum. The second most popular reason was 'to describe library resources'.

Our findings are representative of the research that is being carried on regarding metadata. It should be mentioned though that our finding that the MARC format is the most popular format only within the research sector is contradictory to the association of MARC usage mainly within libraries. The MARC format is traditionally associated with libraries, for this analysis libraries were classified as 'academic sector' where the most popular format appears to be Dublin Core. In all other sectors the dominant format is Dublin Core Element Set. A recent survey of the DCMI Libraries Working Group (Guinchard, 2001) on the use of Dublin Core in libraries indicated that Dublin Core was the most used format in University Libraries because of 'its international acceptance as a de facto standard and its flexibility' (as most popular reasons for it use). 'The most frequently reported Dublin Core implementations were related to subject gateways, and the management of electronic publications, often including theses and dissertations.'

In regard to registries, people appear to be confused and not informed about their functionality and applications.

- Although the 67% of respondents have heard of metadata registries in the past only 24% of respondents have used one.
- Most popular registries were the UKOLN developed and maintained DESIRE and ROADS. The sixteen respondents that have used a registry showed a preference for DESIRE and MetaForm
- Reasons for using a metadata registry in order of preference among the respondents of the four discussion lists were to 'Find out about definitions of elements' and to see 'Dictionary structures'. Workshop participants indicated that reasons for using a metadata registry are to 'Find out about mappings' (100%) and for 'Resource description/Find out about relevant information'. The only other reason stated was to 'check on progress of registries based on ISO/IEC 11179'
- Only 23% of respondents answered that

their organisation has a requirement for a metadata registry, while more than half of these respondents did not specify what kind of requirement.

Metadata and metadata registries appear to be of interest to people among a wide range of industry sectors Communication and circulation of research results and initiatives are a primary need for them, as people seem to require more information on application and use of those services. Thus only 8% of the academic sector and 15% of the 'other' sector said that they would not be interested in finding out more about metadata and metadata registries in the future.

This survey is part of an ongoing research project at City University on the use and functionality of ISO/IEC 1179 metadata registry implementations This survey was a pilot study which sought to monitor terminology associated with metadata, investigate interest in metadata and metadata registries from different professional communities and gather some feedback on their thinking in regard to metadata and registries use. We believe that it met its aims and additionally gave us a good picture of the range of research projects that actively implement metadata and use registries. Also the research provided us with an indication of the professional communities that are most likely to have a requirement for such a service in the future. The study provides a foundation for our next survey which concerns the evaluation of the use and functionality of an active metadata registry (MetaForm. http.//www2.sub.uni-goettingen.de/metaform).

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PADLs: supporting digital scholarship in digital libraries

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This paper introduces digital scholarship a process in which individuals perform all scholarly work electronically, working entirely with digital media A proposal is made for patron-augmented digital libraries (PADLs). a class of digital libraries designed to support the digital scholarship of its patrons PADLs not only provide facilities for search and retrieval of library artefacts, but also allow patrons to augment the library's collection with new artefacts such as annotations, original compositions and organisational structures Finally, a prototype PADL (called Synchrony) providing access to digitised video segments and associated textual transcripts is described. Synchrony allows patrons to search its collection for artefacts, create annotations/original compositions, integrate these artefacts to form synchronized mixed text and video presentations and, after suitable review, publish these presentations into the digital library if desired.

Introduction

Digital library research is mostly focused on he development of large collections of multimedia resources and advanced tools for their indexing and retrieval. While these efforts are essential, it is important to recognise that the ultimate goal of a library, whether physical or digital, is to serve the scholarly needs of its users – whose objectives are not solely the retrieval of library artefacts. Users instead seek these artefacts (the items that constitute a library's holdings) in order to manipulate and combine them to produce new artefacts.

This observation is especially evident in scholarly (work-oriented) settings in which patrons peruse existing artefacts in order to produce new ones Consider as examples, hree commonly occurring scenarios:

1. a faculty member of a university would invariably seek library artefacts (such as books or journals) for the purposes of composing a journal article;
2. an information analyst working for a privately owned organisation must acquire various artefacts in order to produce a report for a staff meeting;
3. a student assigned to produce a term paper must acquire and peruse library artefacts for its successful completion

The use of library artefacts

While these examples portray users of library artefacts in various situations, two common themes are apparent

1. Library artefacts are sought in order to complete a task – typically the production of a new information artefact such as a journal article, a staff report or a term paper
2. These new information artefacts are disseminated – through a formal publication process for the journal article, through handouts and a presentation in the case of the staff report, or through the submission of the paper to an instructor in the case of the student's term paper

Studies of library artefact use support these observations. For example, Levy and Marshall (1995) observed and interviewed a group of information analysts, their managers, information assistants, and technology providers in two organisations in order to gain insights into the use of libraries. While acquiring documents (artefacts) was a crucial component, this represented only an initial step in the analysts' task Once completed, these analysts would then annotate the documents as a means of interpreting them, produce new artefacts and finally disseminate them In addition, analysts would commonly share documents and other interpretative structures of documents with other analysts, as well as establish and maintain 'reading rooms' which serve as collections of reference materials for the benefit of others involved in similar work.

Likewise, Stone (1982) studied humanities scholars and identified five steps that scholars performed in their studies:

1. thinking and talking to others;
2. reading existing material on a topic;
3 studying original sources of information and making observations and notes;
4. drafting a document on what has been found;
5 producing a final document based on the draft

If library use indeed extends beyond search and retrieval, what types of activities do patrons perform? In a study of library use by O'Hara et al. (1998), 25 PhD students in the arts and humanities at Cambridge University were asked to complete a diary of their document-related research activities during a working day. Information recorded included the nature of the research activity, time taken, documents used, support activities performed (such as annotating) and place where the activity was conducted At the end of the working day the subjects were interviewed for approximately an hour They were asked to elaborate on the information recorded in their respective diaries. Using the data collected, a model for document-related activities by library users was developed The model characterised scholarly research as a complex process involving searching, information retrieval, reading, information extraction, annotation, review and writing new compositions. These processes were iterative in nature and occurred over varying periods of time.

These above activities are similar to those found by Case (1991) in interviews with 20 historians to determine their use of information. After searching from a variety of information sources, historians would make annotations and copies of the material, arrange and index the material according to their needs and then produce an original work using the information gathered. Case also found that these activities were often performed concurrently within and across projects.

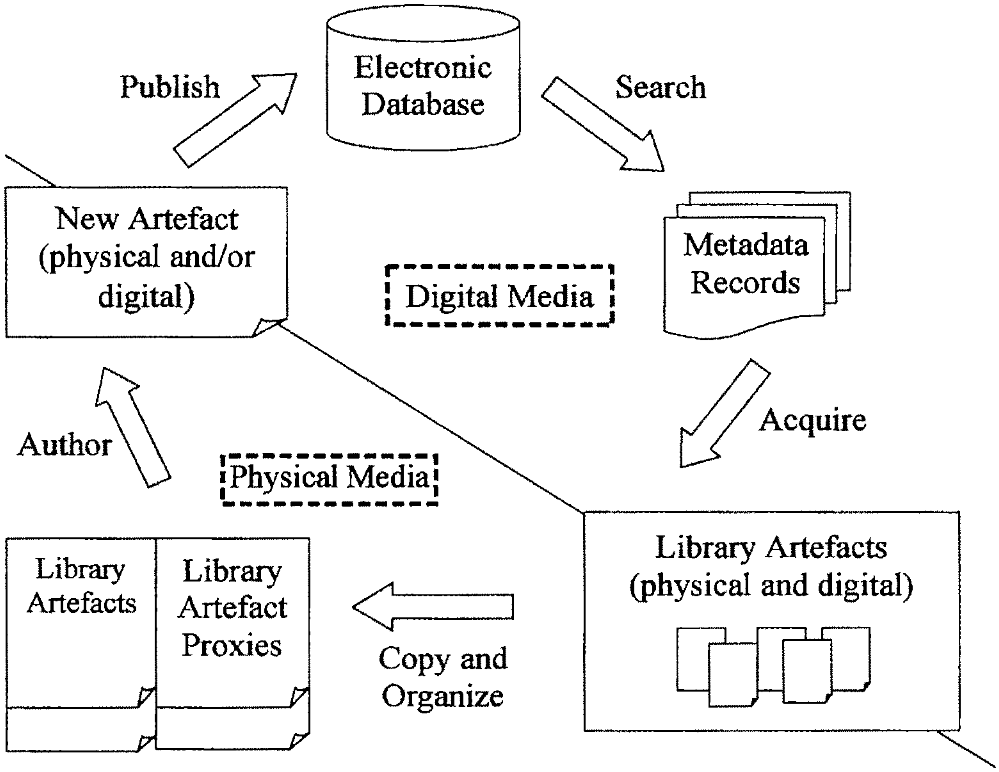
Four activities that occur over library artefacts may thus be identified. Firstly, they are 'acquired' from a library's collection to solve some specific problem. This is typically performed through an iterative searching and/or browsing process (Belkin, 1982; Marchionini, 1995). A second activity involves 'organising' the acquired artefacts to make better sense of the information at hand within the context of the prescribed task. Also known as 'information triage' (Marshall and Shipman, 1997), patrons filter the artefacts to determine the relevancy of each artefact, as well as create various organisations for the artefacts to allow them to be used efficiently and effectively. The third activity involves the 'authoring' of new artefacts using the artefacts already acquired. Artefact types are varied and may range from annotations, to documents and organisational structures (such as indexes). Finally, artefacts are 'published'; that is, the newly authored artefacts are disseminated. The audience of this artefact may be personal (for private use), public (for use by interested parties), or a selected group of users. Methods of publication are also varied and may occur through formal print channels (such as books and journals), presentations, informal handouts and through the World Wide Web.

Digital scholarship

Traditional (as opposed to digital) libraries, with the majority of their holdings in physical form, typically promote a form of scholarship termed in this paper as 'paper-based scholarship' Here, physical media, predominately paper, plays a major role in the scholarly use of library artefacts. For example, although patrons may use electronic databases to search for artefacts, the resulting metadata records point to both physical and digital artefacts, requiring patrons to switch between digital and physical domains in order to accomplish their tasks.

Figure 1 depicts paper-based scholarship as a cyclic set of transitions occurring in both the physical and digital domains. Artefacts (physical and digital) are located electronically through their metadata records. Since scholarship is (mostly) paper-based, copies of physical artefacts (or their proxies) are made for incorporation into the work process. Digital artefacts must also be converted to physical form before they are used (Levy and Marshall, 1995) These copies are then organised and used to author and ultimately publish new artefacts, which again may either be physical or digital The work cycle is completed when the artefacts are incorporated into the library and metadata records are generated for them.

Figure 1 *Paper-based scholarship in traditional libraries*



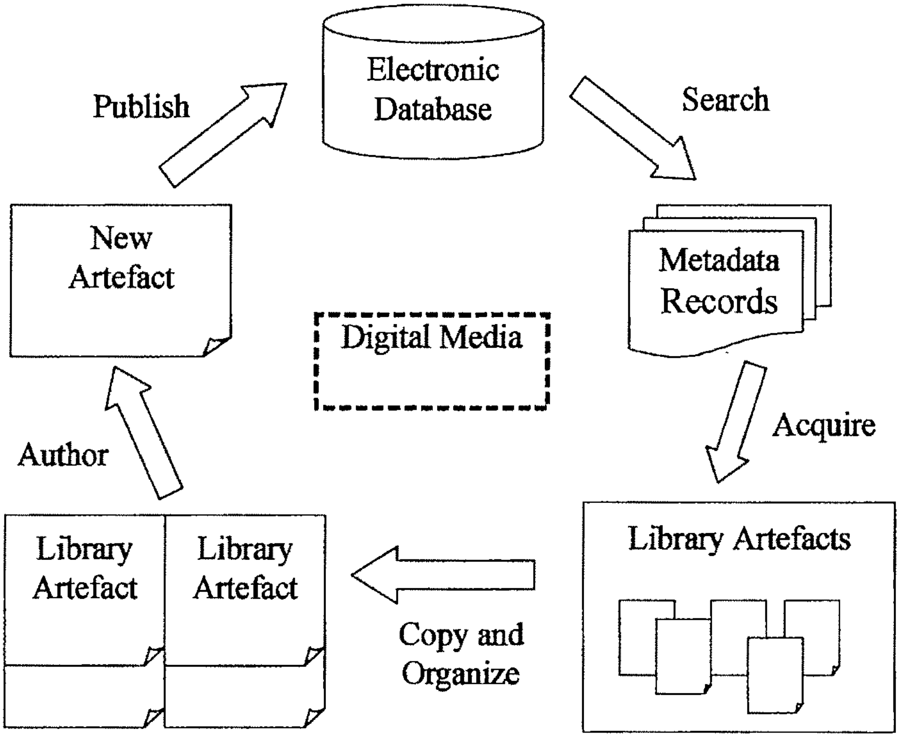
Digital libraries however provide new service opportunities to patrons as well as an expanded set of informational data types (Nürnberg et al., 1995), and thus have the ability to promote 'digital scholarship' As shown in Figure 2, patrons can now perform their scholarly work electronically, working entirely with digital media. Using tools that interface with the digital library patrons are able to search and acquire library artefacts, organise them to form coherent structures suitable to the task at hand, author new artefacts, and publish them electronically for future use.

Digital scholarship offers several advantages over paper-based scholarship. These include:

- **A single access point for library artefacts** Patrons are able to acquire all library artefacts in one location – at the computer. There is no longer a need for a two-step acquisition process in which patrons first search electronic records for artefacts of interest and then physically locate them.

- **New data types and new ways of access and manipulation.** Digital media provide new opportunities for patrons to interact with library artefacts not previously possible with paper-based artefacts Data types such as audio and video can now be used directly in the scholarly process. Patrons can search within artefacts, combine and edit portions of existing artefacts to form new ones, create links/associations between artefacts, and so on.
- **Shorter publication times.** Paper-based artefacts typically take between 12 to 36 months from submission to publication excluding actual authoring time (Denning and Rous, 1995). The digital medium has the potential to shorten such times by supporting online layout/formatting/editing and electronic refereeing services, as well as removing the transitions between physical and digital media

Figure 2 *Digital scholarship in digital libraries*



Patron-augmented digital libraries

There is no doubt that traditional library models, in which searching is the main service provided to patrons and scholarly work is mostly paper-based, have utility. However, we postulate that in many instances an expanded model of digital library services would benefi patrons. That is, digital libraries should provide services that encompass not only searching browsing and retrieval, but an entire range o services that support patrons' digital scholar ship from task inception to task completion.

The question becomes one of the types of services that should be supported Returning to the discussion of artefact use, a plausible starting point would include services for acquiring and organising library artefacts, together with services for authoring and publishing new artefacts. Hence, we propose 'patron-augmented digital libraries' as a class of digital libraries that provide acquiring, organising, authoring and publishing services to patrons. A patron-augmented digital library (PADL) is one whose holdings are enhanced by the digital scholarship of its users – both ibrarians and patrons contribute to the evolution of a library's holdings.

In the PADL model of use librarians popuate the digital library with artefacts that meet he goals of the library. At the same time, patrons may augment the PADL's holdings to meet specific needs through new artefacts such as documents, annotations or other organisational structures over the existing holdings of the library via the support services offered by the PADL. Often the results of a patron's ask (the newly authored artefacts) are deemed useful to the community at large. When this happens the patron may want to publish the artefacts for the benefit of others.

The term 'artefact' used in our research efers to any information-bearing object that s accessible by a patron Two major classes of artefacts are distinguished 'Information arteacts' are artefacts that contain information about a topic and are obtained either by librarans for the purpose of populating the library or by patrons who create and publish them nto the library Examples include electronic books, journals, and so on.'Patron-augmented artefacts' on the other hand, refer to artefacts produced by patrons and incorporated into he digital library after a review process.These may fall into three categories:

- *structuring artefacts* which are used to organise other artefacts;
- *annotations* which provide commentary and context to other artefacts;
- *original compositions* created by patrons.

Patron-augmented artefacts become reusable information artefacts through the publiation process.

It is important to note that while a PADL is designed as an environment for digital scholarship where patrons author and publish artefacts, a system of checks and balances must be in place to ensure the quality of the artefacts produced. For this reason, PADLs must include support for 'publishing policies' that determine if an artefact considered for publication meets the goals and standards of the PADL In other words, artefacts are subject to reviews and these may be as stringent or flexible as necessary depending on the stakeholders of the PADL

PADL services

The facilities provided by a PADL are based on a model of digital scholarship termed ASAP (Goh and Leggett, 2000) This model suggests the need for tools that allow patrons to acquire artefacts from the PADL, organise these to put them into the context of the task, create new artefacts, and finally publish these new artefacts back into the PADL for future use Hence, the minimal requirements for establishing a PADL would include the following services.

Storage and retrieval

A fundamental requirement in all digital libraries is the support for services to store and retrieve artefacts, and in the case of PADLs these artefacts would encompass both information and patron-augmented artefacts. Two important features of a storage and retrieval service are (1) the ability to accommodate artefacts of different multimedia types, and (2) the ability to deliver artefacts to patrons through browsing and searching modes

Publishing

The publishing service functions as an intermediary between a patron who wishes to publish an artefact and the storage and retrieval service responsible for incorporating it into the PADL. A typical publishing service would acquire the artefact from the patron, obtain the necessary metadata for it (from the patron and/or analysis of the artefact), forward it for review, and upon acceptance communicate with the storage and retrieval service for the purposes of storing the artefact in the PADL

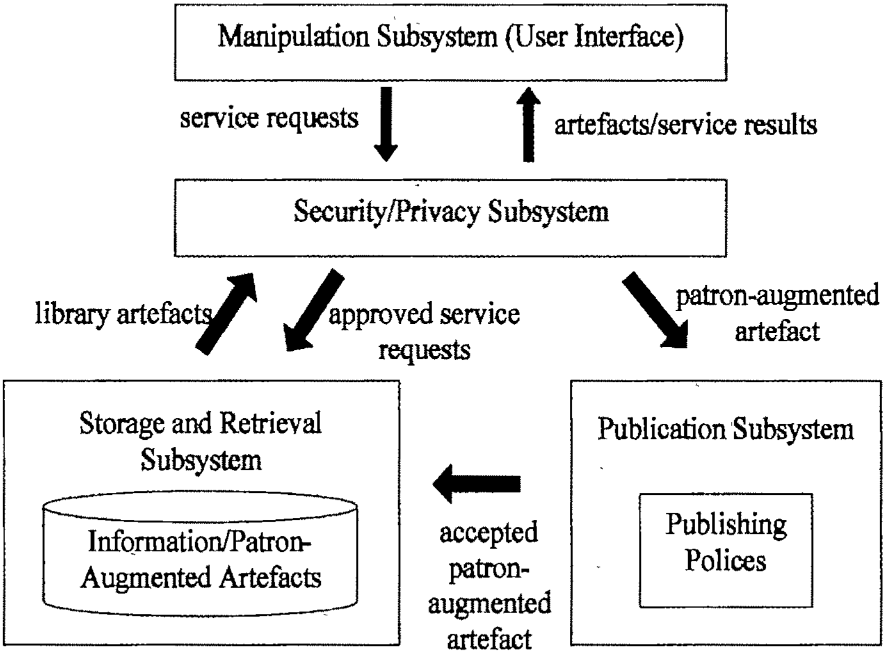
Once again, it must be stressed that publishing policies must be implemented to ensure that published artefacts meet the standards and needs of the PADL.

Manipulation
The manipulation service is responsible for delivering the model of digital scholarship to the user and provides the interface through which the patron interacts with the PADL. All user requests come from this subsystem and all results are returned to this subsystem. The tasks supported by this service include searching/browsing of artefacts, organising/structuring of acquired artefacts, and authoring and publishing of new artefacts. While these tasks may be provided by separate tools, one advantage of a single tool functioning as the access point to the entire PADL is the lower cognitive overhead required by patrons in learning and using the PADL facilities.

Security/privacy
A PADL may be utilised by a large number of patrons and, as such, mechanisms must be present to ensure that artefacts, service requests, and personal information about patrons are secured from unauthorised access (Adam and Yesha, 1996). For example, a system for enforcing access rights is necessary to determine if a patron is able to manipulate (read/write/annotate/reference) published artefacts. Likewise, mechanisms are necessary to ensure that only a patron has access to his/her own personal artefacts and work areas in the PADL.

Figure 3 shows the conceptual architecture underpinning PADLs. Each service is supported by a separate subsystem that interacts with other subsystems in response to users' requests or actions.

Figure 3. *A conceptual architecture for PADLs*


Manipulation Subsystem (User Interface)
service requests
artefacts/service results
Security/Privacy Subsystem
library artefacts
approved service requests
patron-augmented artefact
Storage and Retrieval Subsystem
Information/Patron-Augmented Artefacts
accepted patron-augmented artefact
Publication Subsystem
Publishing Polices

Synchrony

Synchrony (Goh and Leggett, 1999, Goh and Leggett, 2000) is a prototype PADL system that is designed for the purposes of digital scholarship. It allows patrons to search and retrieve artefacts from the library's collection, organise these artefacts to meet the needs of their tasks, author new artefacts, and publish these new artefacts into the digital library

Synchrony's collection of artefacts consists of digitized videos of speeches given by former President George Bush (Senior) and their corresponding textual transcripts acquired in collaboration with archivists at the George Bush Presidential Library and Museum. The transcripts are full-text indexed at the paragraph-level and made available to patrons via standard query operations. In addition, each paragraph is associated with its streaming video segment, allowing patrons to view search results in text-only, video-only, or synchronized text and video formats.

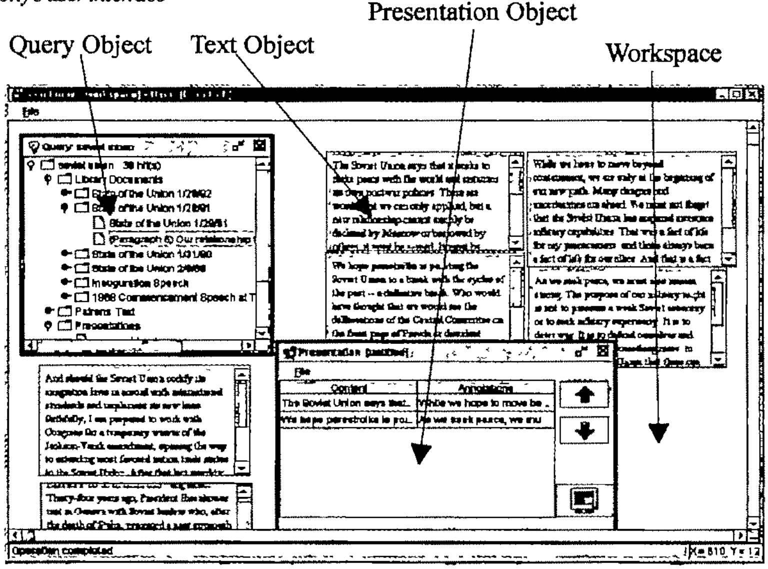
The collection also contains artefacts authored by patrons and these fall into three classes· original compositions, annotations and structuring artefacts. Original compositions are text-based documents that patrons author and publish into the digital library. Annotations are also text-based documents, but are designed to provide commentary and context to other artefacts. Presentations serve as structuring artefacts in Synchrony. These composite entities consist of sequences of artefacts, each of which may contain a video segment of a speech, its corresponding textual transcript and an annotation/original composition displayed in synchrony. Associated with each presentation is a table of contents that allows patrons to navigate to any sequence within the presentation. Artefacts contained within the presentations are referenced, not copied. This allows modifications made to individual artefacts to automatically propagate to presentations if desired.

Synchrony is so named because it allows patrons to author and publish synchronized text and video presentations.

The user interface

Synchrony's user interface is patterned on a spatial metaphor and represents a large, 2½ dimensional direct manipulation workspace in which patrons manipulate and organise objects of different types such as text and presentations. The interface is depicted in Figure 4 and consists of two major entities: the 'workspace' and 'library objects'

Figure 4. *Synchrony's user interface*



The workspace forms the background of the interface and functions much like a physical desktop on which items are placed and a patron's tasks are performed. Library objects, that is the information and patron-augmented artefacts in use by the patron, are positioned on this workspace. Objects may be arranged (by selecting and dragging an object on the workspace), resized (by selecting and dragging an object's borders) and visually altered (by modifying an object's properties such as colour) by the patron to create information structures suitable to the current task. In addition, scrolling and panning are supported to allow patrons to view different portions of the workspace

Library objects are the means with which a patron accomplishes his/her digital scholarship They represent the information and patron-augmented artefacts as well as the results of a patron's tasks in the PADL. Library objects fall into four basic categories:

1. **Query objects** represent the results of a search, with each query object representing one result set. Queries are performed against information artefacts (speeches) and/or patron-augmented artefacts (original compositions, annotations and presentations) depending on the search options selected by the patron
2. **Text objects** represent text-based information and may be of two content types information artefacts (speeches) and patron-augmented artefacts (original compositions and annotations). Text objects allow editing if their underlying content types are editable. In Synchrony published artefacts (those that are part of a PADL's collection) are not editable, while unpublished patron-augmented artefacts are editable by those having the appropriate access rights. For editable text objects text is typed directly on the objects themselves.
3. **Presentation objects** contain presentations authored by patrons and consist of sequences of artefacts each of which may contain a video segment of a speech, its corresponding textual transcript and/or an annotation/original composition displayed in synchrony The contents of a presentation are displayed in tabular form, with each row corresponding to a single sequence in the presentation while columns contain the types of artefacts in use within each sequence
4. **Container objects** are workspaces within the main workspace and may contain query, document, presentation or even other container objects. While positioning may be used to divide a workspace, containers provide a more formal means of doing so, and are thus typically used to organise a workspace into various tasks and subtasks

Synchrony shares common goals with digital library interfaces such as Artemis (Wallace et al , 1998), DLITE (Cousins et al , 1997) and NaviQue (Furnas and Rauch, 1998) in its support for an integrated, direct-manipulation environment for library-related tasks. In terms of design philosophy, however, Synchrony is similar to VIKI (Marshall et al., 1994) in that both systems derive their interfaces from the branch of hypertext/hypermedia systems known as 'spatial hypertext' (Marshall and Shipman, 1993) Spatial hypertext is characterised by the use of space in the creation and perception of structure. Whereas traditional hypertext systems employ explicit linking mechanisms to associate objects (e g unidirectional links between HTML documents) to create information structures, spatial hypertext systems describe associations among objects through space, that is, by geometrical relationships (e.g. proximity), visual characteristics (e.g. font size, colour, shape), and recurrence (e g. relative positioning of an object within a group of objects).

Studies have demonstrated the utility of such systems. For example, an analysis of Aquanet use (a collaborative hypertext tool) (Marshall and Rogers, 1992) found that for drawing relationships between objects, users preferred spatial positioning of objects to communicate structure rather than through predefined schemas (a collection of objects and relationship types). Further, in the Walden's Paths project (Shipman et al., 1998), the spatial hypertext system VIKI has been used to some success in the authoring of paths – linear presentations of existing and new web pages.

A scenario of use

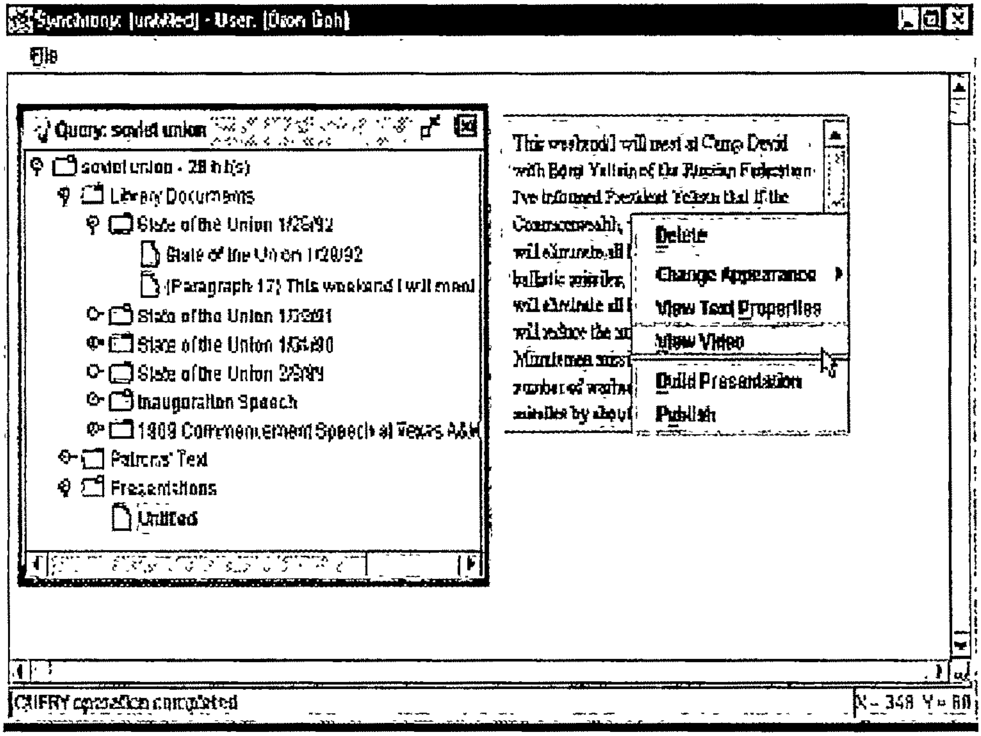
The following scenario illustrates how users may potentially use Synchrony and highlights the operation of the system An educator is preparing a lesson about the Bush presidency and the Soviet Union for his history class and decides to prepare a multimedia presentation of speeches and press conferences given by George Bush on the subject from Synchrony's collection as a resource for his students.

After logging onto Synchrony, the educator is presented with an empty workspace As this will be a new presentation, his first task is to locate relevant information by querying the PADL collection. He thus right-clicks at any point on the workspace to display a list of PADL services and after selecting the query service he enters the query (together with any options) in the dialog box that appears on the workspace

When the query has been processed by Synchrony, a query object appears at the click location showing the results of the query To view an artefact the educator selects it from the query object, drags it onto the workspace and drops it at a desired location. Depending on the artefact type, a text object or a presentation object appears at the drop location. Figure 5 depicts the results of these actions.

After enough information has been retrieved, the educator's next step is to author the presentation Synchrony simplifies the authoring process through a technique known as 'incremental formalisation' (Shipman and McCall, 1994), which attempts to make a system understand informally represented information This feature allows users to rapidly create presentations by first positioning document objects linearly within the workspace and then later specifying which objects to include into the presentation.

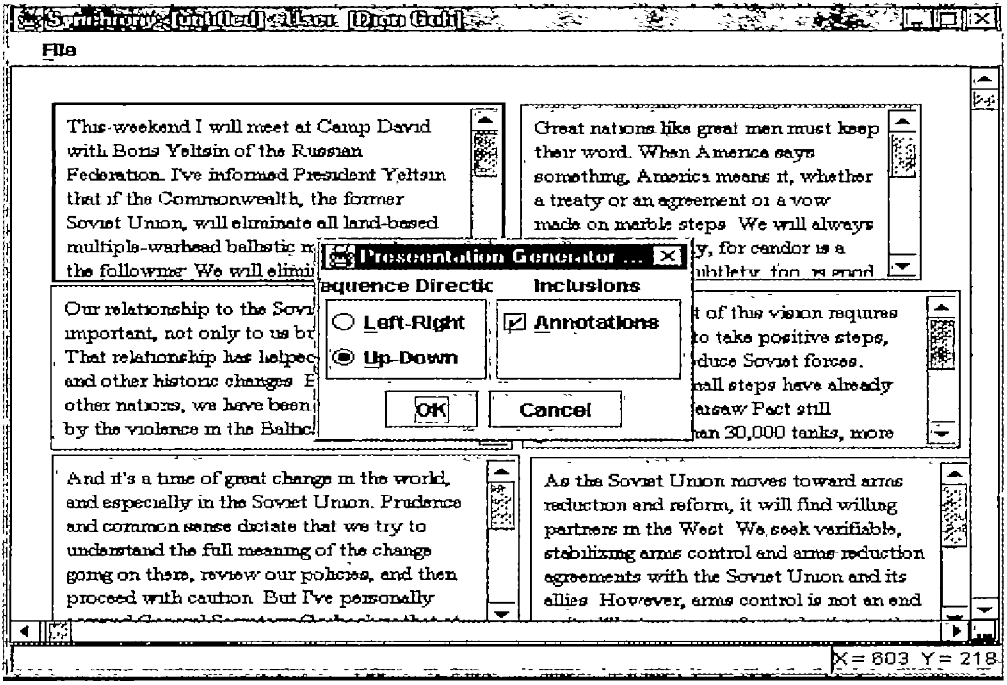
Figure 5 *Selecting and viewing artefacts*


Synchrony: [untitled] - User: [Dion Goh]
File
Query: soviet union
soviet union - 28 hit(s)
Library Documents
State of the Union 1/28/92
State of the Union 1/28/92
(Paragraph 17) This weekend I will meet
State of the Union 1/29/91
State of the Union 1/31/90
State of the Union 2/9/89
Inauguration Speech
1989 Commencement Speech at Texas A&M
Patrons' Text
Presentations
Untitled
Delete
Change Appearance
View Text Properties
View Video
Build Presentation
Publish
QUERY operation completed
X = 348 Y = 80

Returning to the scenario, the educator uses familiar drag-and-drop operations to assemble the text objects (which may include his annotations) to form two vertical adjacent list structures as depicted in Figure 6 He then invokes the presentation building service, causing Synchrony to automatically map these list structures to presentation sequences. In the current version, Synchrony assumes that the leftmost list contains video segments of speeches and their textual transcripts, while the adjacent list to its right is assumed to contain the corresponding annotation/original composition. In other words, sequences are mapped to the rows in the lists in a top-to-bottom manner while content is mapped to the columns. (Synchrony also supports a left-to-right mapping.)

When Synchrony completes the mapping, a presentation object is displayed depicting the contents of the presentation in a tabular format (see Figure 4) In addition to providing a formalised representation of a presentation, the presentation object also allows patrons to modify its contents. Patrons are able to add/remove sequences, add/move/remove content in any sequence, and shift the display order of sequences

Figure 6 *Authoring a presentation*



This weekend I will meet at Camp David with Boris Yeltsin of the Russian Federation. I've informed President Yeltsin that if the Commonwealth, the former Soviet Union, will eliminate all land-based multiple-warhead ballistic m
the following We will elimi

Great nations like great men must keep their word. When America says something, America means it, whether a treaty or an agreement or a vow made on marble steps We will always
y, for candor is a

Our relationship to the Sovi
important, not only to us bu
That relationship has helpec
and other historic changes E
other nations, we have been
by the violence in the Baltic

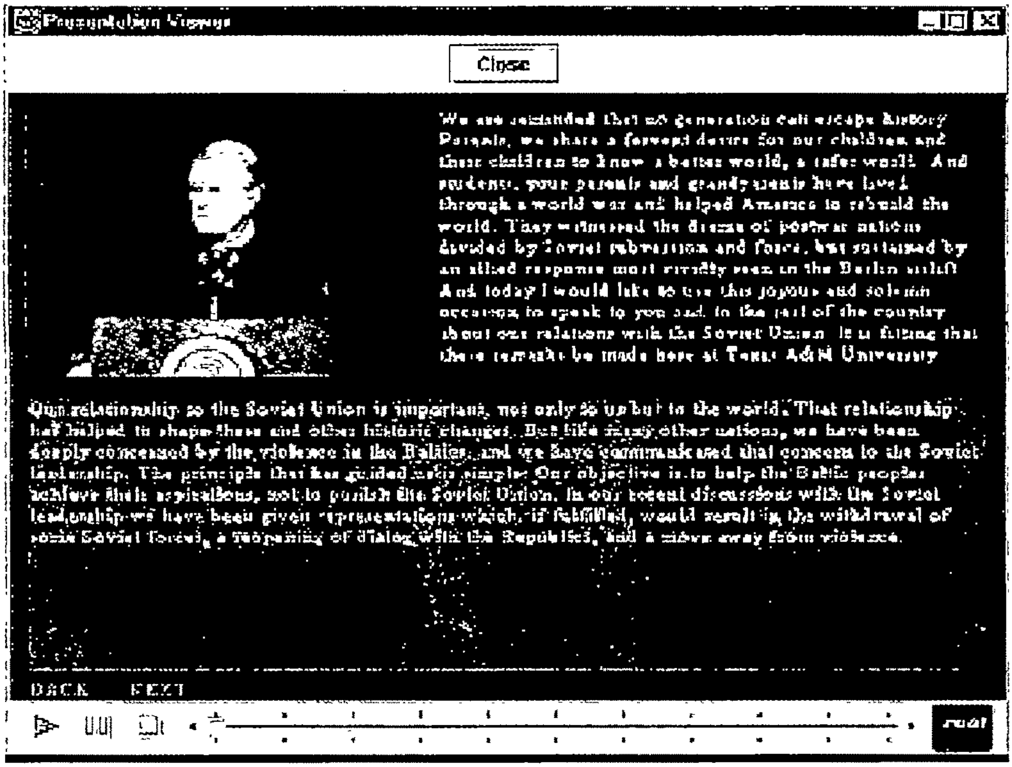
t of this vision requires
to take positive steps,
duce Soviet forces.
nall steps have already
arsaw Pact still
an 30,000 tanks, more

And it's a time of great change in the world, and especially in the Soviet Union. Prudence and common sense dictate that we try to understand the full meaning of the change going on there, review our policies, and then proceed with caution But I've personally

As the Soviet Union moves toward arms reduction and reform, it will find willing partners in the West We seek verifiable, stabilizing arms control and arms reduction agreements with the Soviet Union and its allies However, arms control is not an end

When the educator is ready to view the presentation, he clicks a button on the presentation object. This causes Synchrony to assemble the sequences into a SMIL (Synchronized Multimedia Integration Language) (Hoschka, 1998) presentation and invoke a presentation viewer to display it Figure 7 shows the presentation viewer. The viewer provides playback controls to allow patrons to play, pause, stop and seek. Each presentation sequence consists of three regions – a content region for displaying the text of a speech segment, a video region for presenting the associated video segment, and an annotation region for displaying associated annotations/original compositions

Figure 7. *Viewing a presentation*



When the educator has finished authoring the presentation, he forwards it for review and possible publication by completing a form provided within Synchrony. Here, the educator provides the title of the presentation, a description, and an explanation of why the presentation should be published. Synchrony then uploads the completed form and presentation to the publication subsystem, which stores them in a temporary holding area pending review. At this point, the educator's task is complete. He will later be notified through electronic mail about the outcome of his submission.

In the current version of Synchrony, all presentations submitted for publication are routed to a designated person (a librarian, a reviewer, an editor, etc.). Using a submissions viewing facility, reviewers may accept or reject submissions, or reroute submissions to other reviewers if necessary. When a submission is accepted or rejected the author is informed via electronic mail. Further, if the submission is accepted it is indexed and incorporated into the PADL. To conclude the scenario, the author, upon receiving the acceptance message from the reviewer, informs his students about the presentation. The students may then begin their own Synchrony sessions, retrieve the presentation, and view and interact with it.

Note that for clarity, this scenario portrays the authoring process as a fixed sequence of tasks, that is, querying, organising, viewing and publishing. In reality, Synchrony provides an environment in which these tasks may be performed in a fluid, iterative process. Patrons would move effortlessly among these activities depending upon the need at hand.

Implementation

Synchrony consists of a suite of client-server tools implemented mainly in Java together with two third-party applications. MG (Witten et al., 1999), a public domain full-text indexing and retrieval system, is used for the storage and retrieval of the textual content of speeches. Synchrony also utilises RealNetworks' video server (RealNetworks, 2001) for the delivery of streaming video and its implementation of the Java Media Framework (Javasoft, 2001) for the rendering of video segments and SMIL presentations

Conclusion

Digital libraries must offer more than advanced collection maintenance and retrieval services since patrons often do not solely retrieve library artefacts for their own sake In scholarly settings, patrons instead seek these artefacts to manipulate and integrate them to produce new artefacts. Traditionally, these activities have occurred mainly in physical media (predominantly paper), and as such may be classified as paper-based scholarship. Digital libraries however provide new service opportunities as well as an expanded set of informational data types and, when combined, have the ability to promote digital scholarship Patrons are now able to perform their scholarly work electronically, working entirely with digital media.

We thus propose patron-augmented digital libraries as a class of digital libraries that support the digital scholarship of its patrons. A patron-augmented digital library (PADL) is one in which librarians and patrons both contribute to the evolution of the library's holdings Librarians provide the seed material (information artefacts) to form an initial collection and maintain the collection while patrons augment the library with patron-augmented artefacts over the existing collection. To support this new role, a PADL departs from the traditional library model of service provision and supports authoring, structuring and publishing services in addition to search and retrieval.

Synchrony was developed to determine the feasibility of the PADL concept. The system provides access to a collection of digitized videos of speeches given by former President George Bush and their corresponding textual transcripts together with artefacts authored by patrons.

A pilot study was also conducted on Synchrony and results were encouraging (Goh and Leggett, 2000). In particular, the study found that attitudes toward PADLs in general were positive, provided that appropriate security and quality control (through publication policies) mechanisms were employed However, because this study was performed in a laboratory setting with a small number of subjects, these results cannot be generalised. Consequently, in the next phase of Synchrony's development, we envision a larger-scale longitudinal study that will require participants to use Synchrony to author and publish presentations for actual homework assignments over a semester These results will be used to guide future work in the development of Synchrony and patron-augmented digital libraries

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Political parties on the Net – 4 years closer to cyber-utopia?

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This paper examines the websites of 11 political parties in the run up to the general election of 7th June 2001, to determine whether parties have got to grips with the Internet as a medium for information delivery and campaigning. The websites of all the parties were analysed; and their content, design, interactivity, multimedia features and currency evaluated. Overall, the parties appeared to have developed a more professional and corporate attitude to web design since 1997, and certainly made efforts to keep their web pages up to date. However, the parties tended to conform to a rather sterile design lacking in multimedia features, and mounted only predictable content. Only a few parties had made any special effort to draw users to their websites. Similarly, although interactive features were present, few of these allowed more than a token input into party policy.

Introduction

The general election of 1997 was the first in the UK where parties really had the opportunity to get to grips with the Internet as a medium for campaigning. Although political use of the Internet was clearly in its infancy, many parties (national and local) did establish themselves in cyberspace and made creditable efforts in terms of web design, interactivity and the use of multimedia features. In particular, some of the smaller parties usually marginalised by more traditional media made especially impressive forays into cyberspace (Auty and Nicholas, 1998).

Four years further down the line how much progress have the parties made and just how connected are they? Certainly politics on the Internet has really taken off, both in terms of academic research and political sites on the Net. For the London Mayoral elections all the candidates had web pages and almost all the broadsheet newspapers monitored the campaigns and added the results to their websites. For the election *The Guardian* mounted a section of Guardianunlimited.co.uk devoted entirely to politics (with a daily election bulletin), which was launched at a debate at the LSE on the Net Election Newspapers apart, a whole plethora of political sites has appeared in recent months.

- Tacticalvoter.net was set up to enable voters in marginal seats (such as Wimbledon) to trade their votes online, in the way that was common in the US elections. The introduction to the site read, 'The 1997 election showed that tactical voting works. Lib Dem and Labour voters rallied behind the local challenger who could topple a Tory MP. There was a Labour landslide and the most Lib Dem MPs since 1918. We want to make sure 2001 is another win-win election for the centre-left'.
- There were other tactical voting sites like stophague.com and votedorset.net, Billy Bragg's (the singer-song writer) venture into electoral pacts.
- FaxYourMP.com is a page that enables people to contact their MP by filling in a form on the Web, which is later faxed to the MP by a group of volunteers. Checks are carried out to make sure that the service is being used by genuine constituents and not being hijacked by lobby groups or corporate bodies
- Threelinewhip.com – a service 'Bringing you a variety of useful information on the political scene in the UK, as well as the latest political news. Take the opportunity to

vote on the current burning issues in our online polls. Join the online political debate in the discussion forums.'

- Epolitix.com – an open access site run by the publishers of the *House Magazine* that offers up to the minute political news, biographies, legislation watch, recruitment and parliamentary alerting by e-mail.

Tony Blair has become the first British Prime Minister to receive a petition by e-mail. Clued up stockbrokers e-mailed No 10 a petition requesting the abolition of stamp duty on share transactions. Whether Mr Blair replied by e-mail is less clear though.

Literature review

With the dramatic uptake in the use of technology in almost every aspect of life, it is hardly surprising that the relationship between new technologies and the promotion of democracy has received considerable attention. Indeed, in a recent paper the IPPR and Citizens Online have called for a virtual House of Commons, where the public would be able to deliberate and react to problems and proposals issued by public bodies and government departments. The IPPR and Citizens Online argue that.

> democratic participation will serve to strengthen representation by enabling elected representatives to access more readily the vast repertoire of experiences and expertise to be found among those they represent (Blumler and Coleman, 2001)

The creation of a 'Civic Commons' may well be some way off but the government has started to tackle the notion of using technology to change the way it delivers government services to the citizen. Included in the e-government strategy is the desire to enhance democracy, by methods such as online debate and electronic voting. On 4th May 2000, one ward in Bury (Greater Manchester), Besses in Whitefield, was involved in an experiment to try out a new voting system (Silcock, 2001).

Though electronic voting was not available during the 2001 general election there has been increasing interest in the role that new technologies such as the Internet play in elections. How influential will the sites of individual members and political parties be in swaying votes? Assessments carried out during and after the election campaign of 1997 tended to show that party political websites were not yet making full use of the opportunities provided by the medium (Yates and Perrone, 1998, Gibson and Ward, 1998a) The same study also declared that overall content was not particularly creative and that websites lacked essential elements such as navigation tools, site maps, multimedia and interactivity. However, Rachel Gibson and Stephen Ward found that 'The Internet equalizes voter's ability to access party information, and the quality of the minor parties' Websites rivals that of their major counterparts' (Gibson and Ward, 1998b).

The election of 1997 did act as a stimulus for parties to launch themselves in cyberspace. No political party would now be without a presence on the Web. However, the same cannot be said for the parties at the local level. The uptake 'at the constituency party level or amongst MPs is generally patchy. Only around 10-15% of Labour and Conservative constituency parties and approximately 15% of MPs have websites' (Ward and Gibson, 2001) According to the list kept by Politico's, barely a quarter of all members have set up a home page (Mueller, 2001). Indeed Margaret Moran MP goes as far as saying 'Many Members are clearly not even thinking about using the Web during 'GE2001' and I'm convinced this approach will lose marginal seats for parties.' (Moran, 2001)

The London Mayoral elections and, of course, the 2000 American Presidential election saw a growth in the use of websites for electioneering and also for news and commentary Indeed, some enthusiastic commentators have declared that 'the Internet came of age politically in 2000, with the first election that would not have been the same without it' (Coleman, 2001). Dr. Stephen Coleman warns, that the Internet will inevitably have a different impact in the UK than in the US. He notes that UK elections are based around parties and not well known figures as in the US and this may affect the impact of the Internet. Furthermore, he points out that the number of people with access to the Internet is significantly lower in the UK than in the US. Indeed, it has been stated that 'the first 'Internet election' in the UK will not be until 2005/6' (Coleman, 2001).

The panel who appeared at The Guardian 'Net Election' Conference concur with this view. The panel, who included Mo Mowlam and Caroline Sceats from Forrester Research, concluded that the Internet would not have a profound effect on the 2001 election – that traditional media like newspapers and the television would continue to be the key players in transmitting party messages. Craig Hoyle, the editor of epolitix.com, writing in the *House Magazine*, has stated that 'the role new technologies will play will fall far short of some of the over-hyped predictions about how the Net would change the face of modern elections' (Hoyle, 2001).

However, as Michael White has put it 'there is no putting the e-genie back in his cyber-bottle' (White, 2001) All commentators agree that this election will give an indication of the future role that the Internet might play in politics and that important lessons will have to be learned For instance, there is nothing in electoral law at present that acknowledges the presence of the Internet. According to the Chairman of the Electoral Commission 'the use of the Internet and e-mails is going to be a significant element of our review (of how the election was conducted)' (Eaglesham, 2001). Helpfully, the Hansard Society has set out key issues regarding electoral law and the Internet, to allow for more informed public discussion (Ballinger and Coleman, 2001).

Methodology

So, how well did the parties fare in 2001? The criteria used to evaluate the sites was simply:

- Content
- Design
- Interactivity
- Multimedia
- Currency
- External links

This coincided broadly with the survey reported in Citizens' use of the Internet in Election 2000 by the Hansard Society that stated:

> Citizens desired a specific experience from candidate websites. They wanted content, control, interaction, a usable interface, and unique bells and whistles – an experience slightly different from what they get in the mainstream media (Coleman, 2001).

The evaluation period ran from the announcement of the election on 8th May to Thursday 7th June. One full evaluation was carried out and then the sites were checked periodically to see which features were added and how up to date the content was. The suspicion before the evaluation began was that sites would almost all conform to a similar model of press releases, speeches, campaign materials with very little added value or possibilities for proper two-way debate. As with all such evaluations, we were looking for parties that had gone the extra mile and produced something unique The first omens for the campaign, however, were not promising; *The Times* ran a report on 8th May 'First Internet election starts with spam' (Kite, 2001), when the Conservatives allegedly mailed 20,000 people at random with a spoof greeting card in New Labour colours with Tony Blair animation Perhaps the dirty election campaigns we have seen in the past will be transferred to cyberspace?

The parties covered were selected from the listing on Yahoo! and all were registered political parties, as defined by the Registration of Political Parties Act 1998. They included:

- Labour (http.//www.labour.org.uk/)
- Conservative (http://www.conservatives.com/)
- Liberal Democrat (http://www.libdems.org.uk/)

and smaller parties:

- Green Party (http://www.greenparty.org.uk/ and later http://www.votegreen.org.uk
- British National Party (BNP) (http://www.bnp.org.uk)
- Monster Raving Loony Party (http.//freespace.virgin.net/raving.loony/ and later http.//www.omrlp com/)
- Plaid Cymru (http://ww plaidcymru.org/ and later http.//www.plaidcymru2001.com/
- Scottish National Party (SNP) (http://www.snp org/)
- Socialist Party (http://www socialistparty.org.uk/)
- UK Independence Party (UKIP) (http://

www.independenceuk org.uk/)

- Legalise Cannabis Alliance (LCA) (http://www.lca-uk org/)

It was noted, with some sadness, that the Natural Law Party had decided not to field any candidates in the election so virtual yogic flying lessons would not be part of the campaign. The sense of loss was tempered somewhat by the emergence of the Monster Raving Loony website – a welcome inclusion. Although the list included some parties whose content might be considered offensive, it was important to cover the whole political spectrum and to examine parties traditionally ignored by print and televisual media.

Results

So which of the parties were quick off the blocks and which fell at the first fence? The Conservative site was unavailable on the morning of 8th May but the site was relaunched the same afternoon in full election mode. The Conservative manifesto was released on the 9th and on the Web the same day (though not especially well formatted for users who wanted to print it out) Full marks for promptness. Labour and the Liberal Democrats were also quick to hit the campaign trail in cyberspace, as one would expect. Also keeping up with the front runners were the Monster Raving Loony Party – their general election site was fully functional by 11th May (Vote for Insanity, You Know it makes Sense) and the manifesto was online before that of either Labour or the Liberal Democrats. The SNP election pages were also up and running from the outset, though their manifesto was not launched until 18th May and there was no sign of it online on that day.

Considering that the election of 7th June was Westminster's worst kept secret, parties could hardly have been surprised when it was finally called – however, not all of them were prepared. The Green Party had a provisional list of Prospective Parliamentary Candidates (PPCs) mounted (dated 6th April, suggesting it might have been intended for a 3rd May Election) but the rest of its election site was not ready – anybody who logged on here as late as 20th May would be met by 'Our General Election website will soon be live, with photos and biographies of PPCs'. The BNP, one of the parties which the Hansard Society expected to make full use of a virtual campaign, had a similar message for the first week of the campaign – 'When Tony Blair finally decides to call the Election, the BNP will launch its general election website with full candidates' details, strategy, press centre and much much more' Plaid Cymru made no reference to the election on their site until 17th May.

Full evaluation

In the years since the 1997 general election, parties had clearly made huge advances in their knowledge of Internet technology but we wondered if this affected the quality of their websites in terms of variety and interest. Although party sites were clearly more professional this time round, they tended to conform to a rather tedious model

Design

Judging by the list above, we can see that most of the parties had eventually registered a logical domain in cyberspace that users could relate to It was interesting that only the Conservatives chose to be .com rather than .org, perhaps trying to appeal to the business community In terms of design, many of the parties did conform to a similar pattern and there were only a few examples of inspiration.

The three main parties designed a home page with their party colours much in evidence and tended to opt for a menu system on the left hand side/along the top with the centre of the page reserved for excerpts from press releases (click for more details) or campaign leaflets The Conservatives had a copy of the pregnant Blair election poster on the home page and Labour had four miniatures of their campaign posters.

Without exception, all the sites looked professional and were solidly designed with a good balance of text and white space. A consistent look and feel, something that was not always present in 1997 even amongst the big three, was evident, suggesting that party web pages were now fully ensconced into the party machinery and communications strategy This time round, even the smaller parties had corporate looking, professional websites

– the BNP logo was evident in red, white and blue on every page, while the UKIP used purple and white throughout. The Socialist Party used red images (including ones of Marx and Engels) to good effect against a white background. Plaid Cymru used its logo on every page and the green links turned red when clicked – clever use of party colours. The Legalise Cannabis Alliance (LCA) used buttonhole images of cannabis leaves as clickable links and had an excellent balance of white space and colour on its home page Good progress all round so far.

On the whole, aids to navigation were also present on many of the websites All the parliamentary parties included a search engine, the one on the Liberal Democrat site could be searched in simple or advanced mode. Few of the smaller parties included this feature (the LCA had one of the most advanced search engines), and the BNP did not even bother with home tags from its election pages. Menus and labels used were usually clear, though the UKIP had several options within its menu that might have confused an average surfer – their menu included press releases, media reports, a news index, and a resource centre. Perhaps a sentence of explanation for each would clarify the contents of the pages The Monster Raving Loony Party was the only one with 'under construction' tags! The BNP had two menus on their election pages, though only one of these contained clickable links – a slightly odd arrangement

The Socialist Party website actually contained most of the information carried by the other parties (a manifesto, lists of candidates, how to help), but was let down by its design. Although the page was striking and well laid-out, the general election pages were very well hidden. Users had to scroll half way down the home page to find any reference to the election The election was mentioned on the news page, though it was not the first item, and it was covered in the section on campaigns, though again it was not given any emphasis. This site was really the exception to the rule as most of the party pages were professionally and logically designed

Most of the parties had metadata incorporated into their html coding, though the Conservatives seemed to have missed this along with BNP and LCA The existence of metadata surely points to professional web design and a party that fully understands Internet technology. Also in evidence on many of the sites (not the Monster Raving Loony Party, BNP or Plaid Cymru) were privacy statements, copyright details and information on the security of the sites. The Labour Party was very big in this area with whole pages of explanation on privacy, IT and disability compliance and a complaints procedure. The UKIP had copyright symbols on its pages and included a full privacy statement. The SNP even had guidelines on acceptable use of the images it mounted on its site. Again this suggests a growing professionalism amongst the parties, both large and small, and an awareness of copyright legislation.

At first glance, the Labour site appeared to be quite sterile and spartan, especially compared to the Conservatives and the Liberal Democrats. The background was plain white, the text black (on the whole) and the home page simple and uncluttered. At first we thought this displayed a distinct lack of imagination, but the disability page sets the record straight:

> We believe that it is important to make our website accessible to all potential users. With this in mind we have worked hard to improve the ease of use for visually impaired users. In particular we have ensured the availability of ALT text, a simple and clear approach to on-line layout and improved colour contrast We have also facilitated the use of different browsers in a number of ways including the removal of frames from the site.

This statement made us wonder whether any of the other parties had such a broad outlook. The Labour Party used Bobby as its benchmark. According to the Bobby web page:

> Bobby is a Web-based tool that analyzes Web pages for their accessibility to people with disabilities. Bobby's analysis of accessibility is based on the World Wide Web Consortium's (W3C) Web Accessibility Initiative (WAI) Web Content Accessibility Guidelines (translations available). For example, to become Bobby approved, a

Website must.

- provide text equivalents for all images and multimedia such as animations, audio, and video;
- ensure that all information conveyed with colour is also available without colour;
- identify headers for data tables and make line-by-line reading sensible for layout,
- provide summaries of graphs and charts,
- identify document language and any changes of the language;
- organize content logically and clearly, such as with headings, list elements, meaningful links, and navigation bars;
- provide alternative content for features (e.g., applets or plug-ins) that may not be supported (Bobby)

However, when we submitted the parties' URLs to the applet on the Bobby site, only the Liberal Democrats fulfilled the criteria and received Bobby Approved Status. Even the Labour Party, despite their claims, failed – though perhaps they were working to a different version of compliance.

In general, with the exception of the Monster Raving Loony Party, the sites seemed to have moved away from flashy gimmicky sites that were evident to some extent in 1997 All the sites were solidly designed and lacked some of the amateurism that was evident then. However, this did mean that many of the sites lacked imagination – for example, Plaid Cymru's site was very simply designed using very basic HTML and little formatting. It contained no interactive or multimedia features (except an e-mail news alert) and only contained three images. One redeeming point was the bi-lingual nature of the page (English and Welsh) – the only other party to make efforts in this area was the SNP, whose home page is available in English, French and German

Content

To a large extent, the content of the party pages conformed to the habitual stereotype of press releases, candidate details, speeches, contact details and how to join/donate Only a few parties made additional efforts and mounted original content.

The Liberal Democrats and Conservatives had full biographies for all their prospective parliamentary candidates, whereas the Labour Party had a contact name and summary of achievements for each constituency. A few more personal details might be warranted, but the local touch was appreciated and obviously took some time and thought. The Monster Raving Loonies had only photographs of PPCs and no personal information, though their manifesto page did link to local manifestos where applicable The SNP's PPC profiles also included the previous election results and an e-mail address for all candidates However, the BNP was unwilling to divulge any more than the names of their candidates along with a small photo, while the UKIP only gave the name of the PPC and constituency

News releases and speeches formed a crucial part of most party websites – these are an essential way of keeping voters abreast of policy details and campaign movements. Most of the parties had links to their most recent releases and speeches on the home page – usually in the form of a summary and a link to the full notice. The Monster Raving Loonies had no news pages as such, which was poor. Other parties failed to keep these updated (see the section on currency for more information). For example, the UKIP manifesto was launched on 14th May but there was no mention of this on their website on the 15th. News archives were another welcome addition to party websites along with a facility for searching the news The SNP news archive stretched back to 1996 and the Liberal Democrat archive totalled 1109 articles, as at 14th May 2001. Plaid Cymru only mounted press releases back to 19th March, Labour back to February 2001 and the Conservatives back to September 2000 However, although it was possible to search the Liberal Democrat site, it did not appear possible to search just the news archive by keyword or by date The archive of speeches on conservatives.com could be sorted by date or into an alphabetical order by speaker. The LCA news page contained not only their press releases but also excerpts from newspapers about cannabis or the LCA – a useful monitoring service.

Almost without exception, the parties all loaded copies of their manifestos onto their sites. This may be considered an obvious feature of the campaign but the way in which this was done suggested tokenism rather than a true commitment to information provision. Both the Labour Party and the Conservatives mounted their manifestos in pdf the day they were launched. Acrobat is a common software but not ubiquitous so efforts should have been made to have a plain text alternative. Similarly, the pdf files loaded contained a very small font and were extremely image intensive Both, therefore, took a long time to load and print and the results were inadequate. Plaid Cymru, by contrast, split its manifesto into chapters, which were mounted as simple text files – much more effective The Liberal Democrats had also arranged their manifesto as a series of text files under topic headings – these could be formatted for the printer. They were also the only party to state that their manifesto was also available in large print and on tape by request The LCA did not mount its manifesto online but suggested surfers could purchase it (only by snail mail) – it did have detailed sections on its aims, principles and proposals though and a series of handy leaflets to compensate

Another ubiquitous part of party web pages was the requests to join the party/donate to party funds or volunteer to help in some way. In this respect the parties learned from past mistakes as almost all these requests (with the exception of the Monster Raving Loony Party) could be done online via secure servers. In 1997 more of the parties were still reliant on snail mail or expected supporters to willingly give their credit card details on unsecured servers.The Liberal Democrats were particularly enterprising in this area – you could send an e-mail to a friend from their site, the first line of which the party kindly filled in for you: 'Thought you might like this . I've just found out how you can join the Liberal Democrats online Just go to http://www.libdems org.uk/supportus'. The Conservatives also had this feature, 'If you are finding conservatives.com of interest, why not tell a friend about us? We will send the address of our website address to your friend – and promise not to keep their details any longer than that.' Plaid Cymru did not offer facilities to join or donate online

The UKIP was keen for people to join online, renew membership online, register as both a supporter and a member and register support from abroad. People joining the Monster Raving Loony Party online received a free T-shirt and were asked to specify what size they required on the online form In general, form filling on party websites is much more common and parties of all sizes seem to have realised the potential for generating income and support from the Web. The LCA form even asked whether people would be willing to become candidates for the party online.

These common areas aside, there were still some unique features to be found on party websites. With changes to postal voting in force for this election, the SNP had a page explaining the new procedure to voters – something the UKIP picked up on too. The Labour Party had sections on democracy within the party and the internal decision making process – the only party to be so transparent. There was also a section entitled Labour history that included (apart from a history) a quiz – sadly the quiz was not interactive but this was original. The Labour Party also had an online shop (three egg cups with Conservative faces for £12) that accepted credit card purchases. The UKIP and Plaid Cymru also had history sections.

The BNP was the only party to elucidate on its electoral strategy on its web pages:

> The BNP's electoral strategy is designed to transform the BNP, with the use of intelligent tactics, from a small party unable to make much impact, into a large and mainstream force with election wins under its belt.

Pity it was reluctant to give out any information about its candidates or detail any of its policies in more than two sentences.

Several of the parties, including both Labour and the Liberal Democrats, latched onto the importance of the Net to journalists and both mounted special online media centres. The Labour Party press centre contained keynote speeches and press releases along with photographs of key figures, which it suggested journalists could download to use in print publications. The Liberal Democrat media centre contained their news releases and a search facility for candidates in a particular area. There was also useful information in a technical section on the Labour site covering how to access the Labour site/receive updates via WAP mobile phones or PDA. The instructions were clear and helpful and covered different models of equipment The Conservatives had similar information in their 'On the Move Section'. The importance of the media during elections is clear but only the larger parties appeared to have recognised this by making special efforts on their websites – the BNP also had a press centre but this just contained three phone numbers for anonymous officers.

The BNP was one of the only parties to host an online opinion poll. This asked whether you supported the idea of a referendum on the question of mass immigration. This party also mounted a FAQ page which covered questions like 'Are you a racist party?' and 'Why are you against mixed race relationships?'

The Liberal Democrats were the only party to mount election resources for school children on their (youth) website (http://www.mock-election.org) (though the Conservatives did link to an external organisation hosting such information). The Liberal Democrat site included a copy of their youth manifesto, a guide to running a successful campaign, posters and an order form for mock election packs

Most of the content mounted by the Monster Raving Loony Party was unique. It started by listing past policies, most of which have since been taken up and turned into law – i.e , votes for 18 year olds, all day pub opening It also listed some that have yet to be adopted – such as putting Parliament on wheels. There was also a 'Hall of Fame' on its site for its most and least successful candidates, including its first woman council member (Countess Cooing Cuckoo in Madeley) and the Loony who obtained the least votes in a general election – Russ Sharpe in Stirling in 1992, for those of you who don't know. The Loonies also listed their previous election results back to 1983 and a summary of Screaming Lord Sutch's electoral record. The Monster Raving Loony Party election site was redesigned and relaunched on 22nd May – unfortunately, a lot of the original content was not transferred across and the two sites co-existed uneasily.

The LCA also listed its previous election results (back to 1999) on the Web, along with an events page covering forthcoming and past events.

One thing largely missing from the 1997 sites was criticism of other parties. However, this appeared to be transferring to cyberspace. The Labour Party ran a section criticising the Conservative manifesto and a section entitled 'other parties' that slated the Liberal Democrats, Plaid Cymru and the SNP. The Conservative Party website (diary section) contained this missive about the other main parties, which also featured a rather embarrassing spelling mistake (18th May 2001):

> **WASTE OF TIME**
>
> Lid [sic] Dem leader Charles Kennedy went on a thirty-minute walkabout in Ludlow yesterday. Unfortunately it took him eight hours to get there. Not that anyone noticed he was late
>
> Robin Cook, the gnome-like Foreign Secretary, did not fare so well when the allure of kippers proved too much for him in Brighton yesterday He was almost caught with his trews down as he struggled to find £3.98 to pay.

The Monster Raving Loony Party's section entitled 'Election News' did not contain news releases but spoof election broadcasts for the three main parties. These were flashy gimmicks done in party colours – the Labour one stated 'vote for Labour – we'll promise you the earth but we can't even deliver a pizza' The Liberal Democrats mounted items criticising their rivals, but chose to do this by quoting from their press releases and Hansard contributions, leaving the parties to dig their own graves, so to speak.

Interactivity

Some points here have already been touched upon – Labour's online merchandising and the BNP's opinion poll. Almost all the parties had mailtos or feedback forms as means of contacting the party – for the BNP these were anonymous but many PPCs for other parties had e-mails listed along with contacts for party officers. Who read these and whether they fed into the party decision making process was not stated. Plaid Cymru had biographical details for all its PPCs including mailtos, but unfortunately these were not clickable On a similar theme, all the parties (except Plaid Cymru) had facilities to join online or contribute to party funds or volunteer to help out locally. Sadly, examples of true interaction were mainly lacking from most of the party websites, suggesting that the parties were not interested in two way or bottom up communication but were using the Web as a means of top down dissemination or for raising support or finances – remember, anyone submitting their name to a party website in any capacity provides useful marketing material for the parties. There were exceptions to this rule, but only a few.

The UKIP had a 'forum' on its election pages that allowed surfers to air their opinions on certain topics – the topics ranged from foot and mouth disease to keeping the pound Who chose the issues for debate was not stated, but there were rules to be observed within the forum that were clearly stated on the introductory page – no swearing, no bigotry or racism. All very creditable.

Few parties made use of online opinion polls or votes – some of the things that would constitute full interactivity. The BNP had its single question about immigration but the SNP went one better and had an online survey that asked users to evaluate the website. It also asked surfers for their voting intentions. Users who filled in this form were eligible for a prize draw for which a SNP watch was the first prize. The Liberal Democrats were running a NHS survey which, according to the introductory spiel, would be used to 'help us make better decisions about our NHS policies'. The results would be submitted over a secure server and kept confidential afterwards. It also asked about voting intentions and one of the questions was 'William Hague's Conservatives want to make patients pay more often in a partially privatised NHS. Do you agree you should pay a fee to see your GP?' The Monster Raving Loony Party site ran an opinion poll asking who you wanted to win the next election – users could select from New Labour, Old Tory, same Liberal Democrats, call it a draw, I don't really care.

The Conservatives included a questionnaire on their pages under the heading 'My Manifesto'. This asked surfers to answer questions about their beliefs and priorities in policy areas, and then showed what the Conservatives intended to do in these areas if elected. Each manifesto produced by this process was intended to be tailor-made, but presumably only within the bounds permitted by Conservative policy.

The LCA was the only party to mount an online petition on its web page. This asked users to fill in their name and give either their postal or e-mail address. According to the privacy statement, their name would appear on the ethical-business.com website but the other information would be kept secret.

The Labour Party mounted an online mortgage calculator that asked you to input details of your current repayments, and then told you how much you were saving per month under a Labour government The Labour Party also ran a 'question and answer' page where users could e-mail questions to the party. The users submitting questions remained anonymous and the answers consisted of excerpts from campaign literature or press releases. Not real time interaction but perhaps a step in the right direction. Another quirky interactive feature existed on the Labour site – users could fill in an online form with a friend's mobile phone number and select a preset text message to be sent to them, mainly asking them to support Labour

Many of the parties (including Labour, the Conservatives, Liberal Democrats and Plaid Cymru, but not the Monster Raving Loony Party) ran e-mail news updates for the duration of the campaign. The Liberal Democrats were certainly the experts in this field as their form for updates could be customised to cover certain areas – campaign news, Scottish campaign news, news from Parliament, international news, policy updates etc. Charles Kennedy's campaign diary could also be e-mailed to interested parties. The Conservatives had the usual e-mail news updates but if you registered for the site (again via an online form) you could personalise it – as the site stated·

> . take a moment to register with conservatives com and we promise you a totally new experience within the site. Once you have registered, you will be able to log in within seconds and hear about the things that matter to you You can easily edit these details and preferences every time you are logged in.

Something worthy of credit.

Many of the parties have clickable maps or search engines that allow users to obtain information on their prospective parliamentary candidates or developments in their constituency conservatives com had both a clickable map and a postcode search facility, something the Labour party had taken on too. The SNP had a clickable map of the electoral area for Scotland.

Images and multimedia

Multimedia (moving images and sound) is a feature that sets the Internet apart from its print rivals. During the Mayoral election campaign this was evident on many sites – Susan Kramer's theme tune was present on the Liberal Democrat site, and many candidates used videos of press conferences and major speeches to good effect (Auty and Cowen, 2000). However, the smaller party sites in 2001 seemed strangely lacking in this area. The BNP election pages had no discernible multimedia features, though their general pages include BNP TV The Socialist Party also had no multimedia on site. The minimum a party could do in this field was have photographs mounted on the site – most of the parties (with the exception of the Greens, UKIP and BNP) had pictures of their PPC on the Web, and many had photographs of campaign posters (Labour, Conservatives, and Liberal Democrats), or even photographs from the campaign trail (SNP and Liberal Democrat) Another fairly common and simple use of images was wallpaper or screensavers The Liberal Democrat wallpaper included three pictures of Charles Kennedy available in jpeg or bmp format in different sizes. There were installation instructions given for Macs and Windows based PCs. The Conservatives also had wallpaper, cartoons and screensavers to download, all with installation instructions.

The Liberal Democrats had video clips of three films they had made since the Queen's Speech on 6th December 2000 None specifically to do with the general election though The Conservatives had a soundtrack of their Mike Batt theme tune 'Heartlands' and a video introduction to their manifesto featuring William Hague, a film of a party political broadcast and clips of Hague launching the local election campaign. There was also a webcam that broadcast live during campaign rallies. The Labour Party also made copious efforts in this area – the daily news broadcast at 11 am was available in video format on the Web almost in real time. There was an entire page devoted to audio/visual material that included footage of question and answer sessions by Tony Blair and a couple of speeches There was a video archive of Conference 2000 and a video appreciation of Mo Mowlem. The software needed to watch/listen to these broadcasts was available from the site All very creditable but most of the material was old – Labour pledged to update but the day before the election the most recent audio/visual item was dated 2nd June. The UKIP also had no multimedia on its site and had really missed the boat by providing transcripts of radio and TV interviews rather than video or audio format. Out of the smaller parties, only the Monster Raving Loony Party had really used any multimedia features – the spoof election broadcasts and its introductory page were in shockwave format.

The fact that the non-parliamentary parties have so little multimedia on their web pages makes one suspect that it is either prohibitively expensive or requires a level of HTML programming beyond their level.

Currency

This is really the crux of a good website – one that is updated in real time and contains bang up to date information Some of the parties failed at the outset in this instance – Plaid Cymru had failed to update its website since 2nd April – there was no mention of the general election until the second week of the campaign Similarly the Green Party election material (list of PPCs aside) had failed to materialise by 23rd May. In contrast, the three main parties kept to their respective promises and updated the press and media sections of their sites each day. conservatives.com had mounted a press release entitled 'Labour's manifesto is empty waffle' even before the manifesto had been loaded onto the Labour website. The 'Keeping Up to Date' section of conservatives.com allowed you to be notified by e-mail when the page changed. A couple of snapshot analyses serve to illustrate the state of the parties

- On 17th May, Labour, the Conservatives, Plaid Cymru, the Socialist Party, Legalise Cannabis Alliance, and Liberal Democrats had press releases on their websites dated 17th May. The UKIP and SNP had items dated 11th May and the Greens were way behind with their election website still unlaunched and their most recent news releases dated 8th May. Overall, quite impressive though.
- On 24th May, both Labour and the Liberal Democrats had around four items mounted for the current day by 10 am – the Conservatives were still a day behind but this is still creditable. Plaid Cymru were also a day late and most of the other parties were still way behind – the SNP was stuck on the 11th, Socialist Party on the 18th, UKIP press releases on the 11th' though their media section was up to the 18th.
- The day before the election, 6th June, most of the parties were still creditably up to date. Labour's, Plaid Cymru's and the Conservatives' most recent news releases were dated 5th June, the Liberal Democrats were bang up to date on the 6th The SNP were only a couple of days behind on the 4th. Some of the smaller parties were lagging behind but not vastly so – the Greens were stuck on 30th May, LCA on 1st June.

It was felt that an acknowledgement of the day of the election was extremely important when evaluating the currency of the sites However, disappointingly, Labour was the only website to note that Election Day had arrived. A flashing logo appeared initially in place of the home page which announced, 'to be part of it: vote Labour today X'. The Conservatives incorporated a counter into their site which showed the days, hours, minutes and seconds left until the election (to save the pound), but the sight of a blank counter would not have grabbed many people's attention! The lack of attention paid to the Internet, on the day of the election, suggested that parties did not feel their websites would be swaying undecided voters.

External links

This is an interesting area to analyse. As in 1997, the smaller parties had been much more adventurous in their outlook and even linked to other parties (usually on the basis of common political thought or geographical region) whereas the larger parties would never consider reciprocating links Smaller parties also tended to have more links and be broader in their outlook. This time the type of links was distinctly lacking in imagination with only some of the smaller parties making any kind of effort, though still predictable in nature.

The Labour Party did have a reasonable number of links including links to their connected MPs, costituency sites, regional offices, trade unions, international partners, 10 Downing Street, government departments, and national parliaments. Hardly a sparkling list and no mention of rival parties. There was a disclaimer stating that the Labour Party cannot be held responsible for the contents of the sites listed, nor their reliability. Thoroughly professional, if a bit tedious. The Liberal Democrats had only a small number of links to their Scottish and Welsh branches and Parliament

Conversely, some of the smaller parties are much more open. The UKIP had links to its regional offices and also to other euro-sceptic websites – these numbered around 20 and were listed in no discernible order The Socialist Party linked to local branch sites and also a couple of trade unions, 2 socialist education sites, and 3 international webs. The BNP had an extensive number of links including local parties, about 15 nationalist sites abroad, an aggregated political site, 6 non-white or separatist pages and another 15 in the UK and South Africa unhelpfully listed under miscellaneous. On a similar note, the Green Party linked to all things green and Plaid Cymru to all things Welsh. The LCA had a very extensive set of links that covered the medicinal uses of cannabis, industrial cannabis, cannabis and religion, cannabis activists on the Web and using cannabis. No sign of anybody linking to their rivals though

Conclusion

So, was 2001 the first cyber-election or just another small step on the long road to cyberdemocracy? Judging by the evidence presented, parties have come a long way since 1997 – all the pages were solidly designed and professional looking and, on the whole, kept bang up to date The existence of copyright data, privacy statements, disclaimers and media centres all point to a professional attitude and web pages that are fully part of party machinery. Clearly the parliamentary parties have exploited this aspect of web technology. The result, however, is a collection of web pages of a rather similar ilk and very few unique features. Certainly few parties have made great efforts in terms of interactive features, suggesting that the Net is seen as another means of propagating party doctrine and raising funds rather than canvassing opinions or involving surfers in the decision making process. The lack of multimedia features, though these do exclude users with basic technology, also suggests that parties still have not got to grips with what makes the Internet so different and innovative Those readers surveyed by the Hansard Society who wanted something a little bit different from party websites might be disappointed with the results

To see the real potential of the Web in a political sphere, the parties would do well to look at some of the e-politics sites run by national newspapers for the duration of the campaign. *The Guardian's* politics site (http:// politics guardian co uk/) included fully interactive quizzes (Are you Apathetic? How well do you know your election?), an online poll converter that translated percentages into number of seats in the House of Commons, a clickable guide to the battle buses (apparently the Labour bus had an on board sushi bar), talk boards and videos of election broadcasts. *The Independent's* election pages (http.//election.independent.co.uk/) contained clickable maps showing the 1997 results including percentage turnout and a small spiel on the nature of the constituency, and comments submitted by voters in key constituencies *The Telegraph* (http.//www.election.telegraph co.uk) included an interactive swingometer, and interactive Paxman game where you had to guide Jeremy out of a Pacman style maze, hotly pursued by the heads of well-known politicians Maybe this was the first e-election, but for the media, not the political parties.

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Regulating Internet gambling: the net tightens on online casinos and bookmakers

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Terrestrial gambling is subject to strict regulations in the modern world, which have been established according to social and economic considerations. Policies are enforced within jurisdictional boundaries, however gambling on the Internet renders these policies meaningless, as there are no borders in cyberspace. As gambling is thought to be an activity that needs regulatory control, the governments in each of the three case study countries USA, Australia and Britain are moving towards establishing a policy for gambling on the Internet. This paper examines the social and economic factors involved in establishing such policies, and then discusses how and why each country has arrived at its current situation in regulating Internet gambling The factors in enforcing regulation are also discussed, as is the regulation of Internet gambling at the wider European and global levels

Introduction

Gambling is a human activity that can be traced back through prehistory and a multitude of different forms of gambling are apparent in many different cultures Social factors have influenced how governments approach the issue, resulting in policies that either prohibit or regulate the activity. Prohibition usually occurs when it is against the religious mores of a culture. Regulation is frequently adopted due to the pragmatic viewpoint that it cannot be stamped out, and should therefore be controlled to prevent problem or underage gambling, also to prevent criminal elements from becoming involved

Since the mid 1990s, gambling has become a major growth industry on the Internet, where anyone can bet at any time they like choosing from a plethora of sites. Estimates vary on the number of gambling sites, but the estimate of 1,400 supplied by the Wall Street investment firm, Bear Stearns, appears the most realistic (Gorman, 2001). Most are located off shore to the countries under consideration (USA, Australia and Britain) in places such as the Caribbean, Gibraltar, Liechtenstein and the Dutch Antilles. In these locations, governments take a neutral stance to the issue of regulating Internet gambling and licences are issued to Internet gambling operations for flat fees or a percentage of the takings Datamonitor estimates that the most successful Internet gambling operations turn over more than $1 million per week (Gaming Tech Industry News, 1998). Projections for the growth of Internet gambling vary widely, anywhere from $2.3 billion to $10 billion by the end of 2001 (National Gambling Impact Study Commission Report, 1999). Frost and Sullivan noted that in 1999 the gross revenues for the global online betting market were about $1.5 billion and are estimated to grow at around 45% per annum for the next six years (Warburg, 2000). As a new market opportunity for a well established activity presents itself in an entirely different medium to the one under which it has always operated, legislation has to play catch up with technology setting an astonishing pace and this study aims to examine the issues involved

Each of the three countries under discussion all face the same fundamental social and economic issues whilst grappling with what to do about run-away Internet gambling. These are not so different to those in the real world, but are made more complicated by the medium through which gambling can now be conducted. The concerns about age, problem gambling, integrity, money laundering and taxation are still as pertinent but are much more difficult for a government to control

Each of the three governments under discussion are all subject to different cultural, political and economic influences that affect their individual policy formulation and each has a different process in deciding and implementing legislation This study takes as its main aims an examination of all the issues involved and illustrates why each country has arrived at its current situation with regard to the regulation of Internet gambling.

Definitions, scope and coverage

Gambling can be defined as:

> . any activity in which a person risks something of value on the outcome of an uncertain event, in which the bettor does not exercise any control or is determined predominantly by chance (Cabot, 1999)

The aim is to win a prize, which can be anything of value. Two main types of gambling occur on the Internet: gaming (casino style games) and betting or wagering (racing and sporting events). The generic term 'gambling' refers to both types. Not covered in this study are stock market speculation, fantasy betting, spread betting, lotteries or bingo as they are very different forms of gambling and deserve examination in their individual forms due to unique considerations in their legislation

Some casino sites provide live video feeds with players participating via the Internet Most gaming requires the player to download plug ins, however some games can be played directly with the operator. Transmission speeds of data over the Internet are becoming faster, creating a more realistic gaming situation. Sport and track betting sites offer betting on most types of sporting event and horse/ greyhound racing. There are two main types: the punter places a bet with an operator similar to the way in which s/he would place a bet with a terrestrial operator – it is simply conducted over a different medium, and the second, less common form, in which an operator acts as a broker between home users who are betting against each other on an event and receives commission on the bet.

Typically, people use their credit cards t bet over the Internet by first transferring 'from money' from their accounts to an account se up by the operator. Verification checks take few moments, and the punter is then e-maile back with confirmation and a password Money is then debited from the punter' account by aggregating transactions by th use of electronic chips for gaming and coupon for betting. This method of setting up account into which punters deposit monies saves th cost of financial transactions between th financial service providers and the gamblin operators as it is possible for a punter t gamble any number of times during a session It is possible that digital cash will become th norm for Internet gambling as it lends itsel well to the needs of the medium.

As previously mentioned the focus of thi discussion is the USA, Australia and Britain a they have all been working towards establishing some form of regulation in which variou forms of prohibition and regulation have bee explored. Business and media interest i already picking up on the use of mobile telephones and digital TV as mediums throug which to gamble. However, as legislatio passed will most likely cover all forms of gambling through a remote device, focus will b on the Internet as it already has a good trac record and has received the most attentio from governments and lobbyists.

Methodology

The information used to support the stud comes from two sources. the Internet an from face to face interviews with key industr players. A significant amount of gamblin information on the Internet comes in the form of news articles, lobby statements, government inquiries and industry press release and statements. The majority of this information emanates from America and Australia. I contrast, there is a paucity of informatio from British sources Key industry figures i Britain were therefore identified for the valu of information they could provide. Peter Dean Chairman of the Gaming Board for Grea Britain, David Beeton, Director General of th

Casino Association, Barry Faulkner, Secretary of the Betting Office Licensees Association (BOLA) and Nick Rust, Operations Manager for E-gaming at Ladbrokes International, were all interviewed These interviews were tape-recorded, transcribed and used for analysis in discussion of the common factors facing all three countries in regulating Internet gambling, and for the specific issues that face regulation of the gambling industry in Britain.

The key issues

On May 11, 1995, Interactive Gaming Communications accepted the first wager over the Internet (Brindley, 1999). Since then, its legality has been hotly debated. Those who push for prohibition adopt the viewpoint that gambling on the Internet is dangerous because:

- children could easily access it;
- it will lead to increases in problem and pathological gambling;
- criminal elements would find it all too easy to become involved;
- the integrity of operators cannot be currently guaranteed,
- it takes money from regulated terrestrial gambling and associated businesses, and
- leaches money from people but does not pay anything back to society as companies are located offshore and are therefore not subject to taxation.

A key supporter of this view is Senator Jon Kyl who is the main sponsor of the Internet Gambling Prohibition Act (IGPA) presented to US Congress in 1998 and 1999. He is supported by several lobby groups such as The Family Research Council, the National Coalition Against Legalized Gambling, the National Association of Attorneys General and several American collegiate sports associations. The banning of Internet gambling is not a clear-cut political issue in that it is supported by the right or left wing in any government. Tom Bell comments that, 'since neither Democrats nor Republicans will defend Internet gambling as a matter of principal, lobbyists have rushed into the vacuum' (Bell, 1999).

The opposing camp adopts a pragmatic viewpoint supporting regulation. One of the key assertions is that the porous nature of the Web facilitates and does not interpret information, rendering prohibition impossible (Bell, 1999). Another, as presented by the Gaming Board for Great Britain, is based on the stance that because there is a substantial domestic and worldwide market, it would 'allow British operations the chance to share in the opportunities available' (The Gaming Board, 2000a). The Australian Federal government stated in 1997 that 'regulation [is] the best way to ensure fairness, credibility and accountability through licensing, regulation and enforcement' (GamingTech Industry News, 2000). The Internet gambling industry is keen for regulation as it appreciates that it is a means of keeping undesirable elements away from the arena, and is therefore a method of preventing trustworthy operators from being tarnished by a bad image. The Interactive Gaming Council (a trade association for the international Internet gaming community) comments that 'regulation, not prohibition provides the best form of consumer protection' (Schnieder, 1999).

Integrity

Integrity is of central importance to gambling. It is essential for a gambler to believe that the games are not rigged, the odds have not been tampered with or that the outcomes of sporting events have not been predetermined. However, as fixing games is much easier in an electronic format, Senator Jon Kyl once quoted, 'Anyone who gambles over the Internet is making a sucker bet' (Kyl, 1999). The gambling industry argues that regulation is one way to ensure probiety, protecting both players and operators who want to play fair and not be tarnished by a bad image. David Beeton commented that.

> For a big company like William Hill or Ladbrokes – for whom goodwill and reputation is everything – they don't want to be associated with unscrupulous operators. The difficulty with the Internet is that in the minds of players, it's very difficult to distinguish (Beeton, 2000).

The issue is not simply the protection of individual players, but also the image of established and respected companies.

Where regulation has been achieved, as is the case in Australia, it is unlikely that if someone were to gamble with one of the 14 licensed and regulated sites, they would not receive their winnings or that the machines would be unfairly rigged. *Netbets: a review of online gambling in Australia*, an influential Australian report by the Senate Select Committee on Information Technologies (hereafter referred to as 'Netbets'), commented that.

> Regulation of online gambling is a valuable marketing tool . Given that hundreds of online gambling sites are in operation, the competitive advantage that an Australian licence offers is highly sought after (Australian Senate Select Committee on Information Technologies, 2000, p. 21).

The value of this is shown by attempts made by non-regulated operators to pretend that they are regulated. For example, in the early days of regulated online gambling in Australia, the ultimate owners of a site calling itself 'Casino Australia' used the Internet address of www.casinoaustralia.com. The site was actually operating though a server in Canada, owned by Kenny Rogers Casino (American), and licensed in the Netherlands Antilles (Australian Senate Select Committee on Information Technologies, 2000, p. 24)

Gambling on the Internet brings a set of integrity issues that are not just about the games or events themselves. For example, credit card numbers and details may be vulnerable: they could either be hijacked by hackers or through the use of ghost program; the operators could take customer details and use them for purposes other than gambling. It could be argued that giving credit card details over the phone (as is common in bookmaking) is just as risky, but attracts less suspicion as there is a physical location that players could access should such a problem occur Also, if players download games, it is of obvious importance that the programs do not contain any viruses.

Problem gambling

One of the main drivers behind a push for prohibition of Internet gambling has been the fear that it could contribute towards problem gambling. Problem gambling occurs when 'a person's gambling activity gives rise to harm the individual player, and/or to his or her family, and may extend into the community' (Haswell, 1999). This allows for many degrees of difficulty that a person may experience in controlling their gambling, from mild to severe. The personal and social costs of problem gambling can be very high, ranging from financial, health, psychiatric, family, employment and illegal activities.

Specific to online gambling is the role of technology contributing towards alterations in gambling habits. There are no closing times as exercised by terrestrial operations, and it is possible to continue gambling for as long as wanted. There is also a departure from reality in the sense that gambling on the Internet does not involve real cash, and it has been suggested that a gambler may lose control as he or she cannot see a pile of money or chips disappearing. Gambling on the Internet departs from the practice of gambling with others in a social setting, creating the disadvantage that there are no friends or associates around to discourage a gambler from going too far. Dr Mark Griffiths has commented that, 'Retrospectively, most problem gamblers report that at the height of their problem gambling, it is a solitary affair' (Griffiths, 1999). It is also not possible for an operator of an Internet gambling site to discern whether someone is under the influence of drink or drugs and might therefore gamble in a way that they would not do if they were sober.

Dr Griffiths has also commented that 'to a gambling addict, the Internet could potentially be a very dangerous medium' (Griffiths, 1999). This is because if a person has a tendency to problem gambling the vast resources available provide a platform from which to feed their addiction The concept of acute Internet gambling addiction has been picked up in America. Senator Jon Kyl has expressed his support for the assertion that electronic gambling is the 'crack-cocaine of gambling' (Kyl, 1999).

It is possible that as more people become exposed to gambling, problem gambler numbers will increase. However, David Beeton points out that although there may be a higher number of people gambling, evidence suggests that the proportion of problem gamblers would remain the same – at 1% of the population or less (Beeton, 2000). This is supported by the IGC who cite a report by the University of Chicago's National Opinion Research Center (NORC) which found:

> ...that while problem and pathological gambling is a significant issue, it is not at the epidemic proportions that Senator Kyl and others have claimed (Schnieder, 1999).

The Internet gambling industry has been quick to point out ways that the issue of problem gambling can be addressed. Many sites have links to GamCare and Gamblers Anonymous, also placing visible reminders for people to gamble responsibly Australian sites include facilities such as cooling off periods and self-exclusion. Both the IGC and Dr Griffiths point out that computer technologies can track patterns of behaviour that point to problem gambling and can be used either in the identification of problem gamblers or help contribute to a greater understanding of the problem. This is important as more research is needed into this area to ascertain whether or not Internet gambling will lead to increases in problem gambling, or if numbers will stay at the same proportional level as some believe.

Underage gambling

The legal age for gambling is 18 in Britain and Australia and varies state by state in America between 18 and 21 By the nature of gambling over the Internet, it is not possible for an operator to see the customers and to get a visible check to see if they are who they say they are and that they are of a legal age to gamble The *National Gambling Impact Study Commission Report* (NGISC) states that:

> Most sites rely on the registrant to disclose his or her correct age and make little or no attempt to verify the accuracy of the information. Underage gamblers can use their parents' credit cards or even their own credit and debit cards to register and set up accounts for use at Internet gambling sites (National Gambling Impact Study Commission Report, 1999)

Senator Kyl has echoed this concern stating that it would be all too easy for a child to 'Click the mouse and lose the house' (Brunker, 2000). Given that children are often more Net savvy than their parents, the worry that children could gamble is understandable

The IGC comments that, 'Clearly it is inappropriate for children to be allowed to gamble', but does not agree that what is described as the 'Kyl scenario' will take place because:

> The credit card owner is not responsible for such charges. Moreover, children are not liable for gambling debts The only loser when a minor gambles online is the casino operator, who must refund any proceeds to the bank, and often pays a penalty for accepting the transaction in the first place (Schnieder, 1999).

Nick Rust comments that at Ladbrokes customers are checked against the electoral role and against the credit card company information, which he claims gives around 98% proof of someone's age. He also commented that:

> . . . it would only be malicious if a child used an adult's credit card, as the winnings are paid back directly to the card – not the person. We've not had one case of that (Rust, 2000)

Similar to Ladbrokes, in 'Netbets', the Chairman of Canbet Pty Ltd 'indicates his organisation has never had a case of gambling by a minor' (Australian Senate Select Committee on Information Technologies, 2000, p. 92)

The danger perhaps lies more in 'practice' gambling. This is common on many sites on the Web that allow dummy gambles, in which money is not staked. The Inter Church Gambling Taskforce in Australia points out that these kinds of sites may provide an environment in which children get a taste for gambling:

> ...and condition minors into patterns of gambling which can result in significant problems once they become old enough to gamble 'for real' and with money (Australian Senate Select Committee on Information Technologies, 2000, p. 91)

However, as gambling in general has become much more open in recent years, to say that Internet gambling alone will incite children into gambling is to ignore the broader gambling picture.

Taxation

Governments that regulate land gambling make significant amounts of money from taxation. During 1998/99, the general betting duty yield from bookmakers in Britain amounted to £480 million (HM Customs & Excise, 2000) and that of casinos for 1999/2000 amounted to £90.8 million (The Gaming Board, 2000b). Figures overseas are much higher: in Australia estimates of total terrestrial gambling taxes for the year 1997/98 are around A$3.8 billion (Australian Productivity Commission, 2000), while in America, bookmaking earned the government $6 billion and casinos just under $2.2 billion (Sinclair, 1999). It is therefore often argued that it is in the interests of a government to regulate Internet gambling as it will receive significant funds from taxation. The converse of this is that unregulated gambling will lose governments potentially large sums of money by missing out on tax raising opportunities on the Internet

One of the difficulties that a government may face in changing taxation for Internet betting may come from public perception. If it is perceived as being too low it could be regarded as encouraging people to gamble. Although attitudes to gambling are becoming more relaxed, this could spark a negative reaction. If it is too high then the government could be seen to be trying to make too much money from it. An example of this was the introduction of 50% tax on revenue from Internet operators in Victoria, Australia, in May 1999. Crown Casinos Chairman, Mr Lloyd Williams said, 'A 50 per cent tax rate on revenues? So they [the Government] are a joint venture partner!' (Wood, 1999). There is clearly a fine balance to be found in taxing a regulated Internet gambling environment that encourages industry growth, satisfies government fiscal requirements and is socially acceptable.

The impact on bricks and mortar (BAM) operations

It is possible that the threat to BAM depends on the gambling cultures specific to different countries. Casinos in Britain are very different to those in America or Australia. In Britain, a casino is only allowed to have 10 gaming machines at the most; the vast majority of gaming takes place at tables. The emphasis is on socialising and admittance to a casino is not immediate; a player has to make an application to gamble. In America, especially in Las Vegas casinos, 90% of gaming takes place on slot machines or video poker games (Beeton, 2000), these can easily be replicated on the Internet, and online gaming in America is hence seen as a greater threat to the establishment.

Findings from Australia however refute the idea that the Internet will definitely take away business from land operations. When 'pokies', i.e. poker/fruit machines, were introduced into the state of South Australia, the first two years saw a 53% increase in gambling expenditure in the state. Although the Northern Territory Legislative Assembly Select Committee on Interactive Gaming said that gambling via the Internet or interactive TV would substitute other gambling expenditure, this has been shown to be unlikely as pokies illustrated the 'tendency for new forms of gambling in Australia to increase market size rather than merely eroding revenues from existing sources of gambling' (James, 1999).

Bookmakers present a different story again. As telephone bookmaking has been around for some time, the Internet has made little impact on their figures for people who gamble in BAM operations as it is simply another medium through which to place bets. Barry Faulkner has commented that with time some bookies will close down as a continuation of general trend, but did not think that bookmakers will close down altogether as the atmosphere of a bookies is hard to beat. Part of the issue is also that a lot of people want to be paid cash for their winnings He said that:

> One of our members has an operation off shore, but some people have recently stopped betting with him on line, and are actually now returning to his shop . to get back into betting, and being paid out, in cash (Faulkner, 2000).

Interviewees all cited the atmosphere in betting shops as being an important part of the gambling experience. There is a strong sense of camaraderie in betting shops; people can compare their luck, pass on tips, boast about their successes and generally socialise.

Many feel that as this is lacking online, it is unlikely that the popularity of betting shops will diminish to the extent that they close down altogether. It has also been suggested that people who frequent betting shops on a regular basis are unlikely to invest in a computer: they cannot afford to buy one, simply prefer to bet as they always have, are uninterested in the Internet as a new betting medium.

It is possible that the betting market will be far more affected when betting through a mobile phone or via interactive TV reaches a wider customer base For example, through the TV keyboard it will be possible to bet in real time as a football match or sporting event progresses. Nick Rust explained that the bets would follow patterns such as

> Who's going to score the next goal, which player's going to get the next yellow card? So it's easy, simple, quick, instant bets, appealing to the masses really. We see that being twice as big as the Internet is at this time (Rust, 2000).

It remains to be seen if bookmakers or the Internet will lose customers to Digital TV, or whether it will expand the gambling market as seen with the pokies in South Australia There has been no suggestion of casino gambling being available on interactive TV, and it is unlikely to happen in the near future given the nature of the games. However, if interactive TV betting proves to be hugely popular, it could well be that as new forms of gambling on the digital platform become available. the gambling market could again grow in new directions.

National case studies

The progress of regulation in Australia

Australia is in the unusual position of having travelled full circle around the issues of regulation and prohibition. Initially, in the mid 1990s, it was a pioneer in the field of regulating Internet gambling. In 1995, the Chief Executive Forum of Australasian Gaming Regulators formed a working group that focused on Internet gaming. Internet wagering is covered by the actions of the Officers' Working Party on Interactive Wagering and is an adaptation of rules applied to telephone betting – all States and Territories are in agreement with policies enacted (Australian Senate Select Committee on Information Technologies, 2000, p. 37). Taking the pragmatic route, the Forum decided to opt for regulation and recommended the development of a co-operative approach involving all Australian jurisdictions, with the aim of establishing common regulatory guidelines (James, 1999). In the following year, Ministers from all States and Territories agreed that principles for a national regulatory model should be drawn up and then presented to their respective governments. Key elements of this Draft National Regulatory Model were focused on player protection measures designed to prevent minors from taking part, discouraging the development of problem gambling and enforcing strict auditing to ensure fairness (Gaming Tech Industry News, 2000). The first Bill to be introduced to state parliament bringing into fruition the concepts outlined in the Draft National Regulatory Model was the Queensland Interactive Gambling (Player Protection) Act, which was passed and enacted in 1998. And the second, the Gaming Control (Internet Gaming) Regulation 1998, passed in the Northern Territory. By March 2000, 14 licenced Internet gambling operations were in existence.

As the Draft National Regulatory Model was only a set of policy principles, problems started to emerge as there were state variances in individual policies. For example, the Queensland Act not only allows for self-exclusion, but also third party and is applicable once in force throughout the whole state In the Northern Territory, only self-exclusion is possible and can only be established with individual operators. Taxation was paid according to agreements between participating jurisdictions only. These differences in legislation are important as they undermined the principles of the Draft Regulatory Control Model, which aimed at national cohesion in Internet gambling regulation

Initially, the Australian Internet gambling industry was a huge success, describing itself as the 'market leader' and attracting a global customer base (Australian Senate Select Committee on Information Technologies, 2000, pp. 2-3) However, problems began to emerge with the publication of *Australia's Gambling*

Industries by the Productivity Commission, which estimated that the numbers of problem gamblers in the country stood at around 2.1% of Australian adults (290,000 people) (Australia's Productivity Commission, 2000). The Prime Minister, John Howard, immediately set up a Ministerial Council for problem gambling, and then announced that the issue of Internet gambling would be more closely investigated by the commonwealth government. The subdued news was reinforced by the consequent March 2000 publication of *Netbets. a review of online gambling in Australia* by the Senate Select Committee on Information Technologies. The most far reaching amongst several recommendations made was that a moratorium should be established on the Internet gambling industry (Australian Senate Select Committee on Information Technologies, 2000, p. 10) The proposals meant that the 14 operators already issued with licences could continue to operate, but no new ones could be given out.

Despite the support of the commonwealth government for the moratorium, voluntary support only emanated from New South Wales. Legislation was eventually passed in December 2000 imposing a 12-month moratorium, retrospective to 19th May. The examination of a complete ban of Internet gambling was announced by Senator Richard Alston and the subsequent report, *Report of the investigation into the feasibility and consequences of banning interactive gambling*, by the National Office for the Information Economy (NOIE), was published in March 2001.

Following recommendations made in the NOIE report, the government then proposed to ban Australians from online gambling in any medium – Internet, interactive television or mobile phone. The ban would apply to sports books as well as casinos, though telephone betting would remain unaffected. Perhaps the strangest twist of these proposals was that operators would be allowed to continue business, but only if they offered gambling to foreigners and not Australians!

The government filed the 'Interactive Gambling Bill 2001' in April 2001, and following the Senate committee's report on 23rd May the Senate was due to vote in early June. This means that the Australian Internet gambling industry is still in a state of suspension until the final outcome is known Since the enactment of the moratorium, three online casinos have shut down due to losses incurred (Faust, 2000a) How exactly the government will enact the ban remains to be seen.

The NOIE report examined four methods of filtering Internet content, but states that none would be 100% effective in blocking Australians' access to online gambling sites. These four methods are (National Office for the Information Economy, 2001, pp: 39-44)·

1. Packet filtering

This works by examining the numerical IP address of a website and comparing it to a list of prohibited sites (which would have to be constantly maintained and updated). A main advantage of this is that it is faster than other filtering technologies, but can be indiscriminate in its application.

2. Content filtering

These examine the information contained in Internet traffic and look for keywords, either in the overall content or the URL. A problem with this is that it could prohibit access to sites offering help to problem gamblers – and the words 'gamble' or 'bet' are used so much in normal communication that it could block out many more sites than intended.

3. Router filtering

This relies on using the established routes that allows sites on the Internet to be located The information used for this is stored in tabular form on devices called routers. A main disadvantage of this is that tampering with the router tables could result in a severe impact on the performance and stability of the Internet

4. Detection-response filtering

This relies on technology that examines Internet traffic for predefined content known to be associated with gambling sites. If a positive match occurs with access to restricted content being attempted, the filter responds by 'resetting' the connection between the user and the restricted site. An advantage of this method is that it does not interfere with the flow of Internet data; it operates alongside the data flow.

The NOIE report commented that:

> [although] these filters may prove relatively effective at preventing access to restricted content, there are a variety of methods that motivated and/or skilled users can use to circumvent each technology... Relatively simple methods such as dialling an overseas service provider from Australia could circumvent most blocking mechanisms, and are almost impossible to prevent without significantly more invasive powers of detection (National Office for the Information Economy, 2001, pp. 44-45)

If Australia does ban Internet gambling to its citizens altogether, it will be an astoundingly fast dismantling of an industry which held high hopes for itself and its place in the global marketplace. It is possible that this is simply an election gimmick for the Howard administration – to be seen to be 'doing something' to prevent the growth of problem gambling – however, attempting to ban Internet gambling, because of the nature of the medium through which it is conducted, may prove futile.

The progress of regulation in Britain

Much of current British legislation that controls gambling is now more than thirty years old Since the 1963 Betting, Gaming and Lotteries Act, the 1968 Gaming Act and the 1976 Lotteries and Amusements Act, a great deal has changed in British gambling, not least the fact that technologies and social attitudes are now very different.

Britain currently has no regulation in place with regard to the regulation of Internet gaming or betting. The large established companies like Victor Chandler, William Hill, Ladbrokes and Coral all have offshore operations now, which came about mainly to remain competitive in the new Internet marketplace and to avoid the betting levy on sports and racing gambling which currently stands at 9%. They are able to do this as it is not illegal for a British citizen to gamble with an offshore operator, nor is it prohibited for an operator located off the mainland to accept a bet from British citizens. It would be illegal, however, for a British Internet operator that is located onshore to accept or offer bets from or to citizens. All offshore operations can of course accept bets from any non-British punter, though are wary of accepting wagers from American citizens.

The situation stands to change rapidly in the near future. In the March 2001 Budget, Gordon Brown announced that the government is to abolish the 9% duty on bets and replace it with a 15% tax on gross profits, beginning in 2002. Barry Faulkner pointed out a virtue of this in that:

> Bookmakers can then go for the international markets where the bets tend to be lower margin bets... and then when someone from China comes and has a bet here, the taxation goes to the British government (Faulkner, 2000)

In return, the big bookmakers (apart from Victor Chandler) have pledged to close down their offshore operations, return to the UK and pay the 15% GPT (Waples, 2001)

The GPT model, however, still requires taxation at a higher rate than offshore bookmakers currently pay. Smaller operations and Victor Chandler do not aim to return as a means of avoiding any tax at all. To illustrate this, Barry Faulkner stated, 'The highest [taxation] I've heard is one of the offshore sites charging 1% of turnover. In some places it's £50,000 – flat rate' (Faulkner, 2000). If migration of bookmakers back to UK shores is to become reality, it must be because there is a perceived commercial advantage Peter Dean, Chairman of the Gaming Board for Great Britain, pointed out that regulation might provide this leverage by commenting that off shore gambling operations (both for gaming and betting) would weigh up the choice of returning by considering cost/benefit implications He stated, 'My guess is that there is a price that they're prepared to pay to get the respectability and the commercial advantage of having a clearly regulated environment' (Dean, 2000).

In a similar vein with regard to casino gambling, David Beeton commented.

> there's no doubt at all if Internet gaming is subject to the same taxing paying regime as land gaming, then foreign operators

would clean up the market, because... [casino] tax can be up to forty percent and would affect the odds or the operability of the operation so much that somebody operating on a much lower tax base would have an overwhelming advantage (Beeton, 2000).

Since the victory of the big bookmakers over taxation, it is possible that the casino industry in the UK will now start to pressure for similar changes to taxation laws.

The first concrete signs of action by the British government began in November 1999. The Gaming Board of Great Britain made a study of Internet gambling based on growing concerns about the industry. The report recommended to Mike O'Brien, the Minister responsible for gambling policy, that new forms of legislation should come in to permit, regulate and tax Internet gaming, and says that this option is 'also supported by nearly all respondents to the Board's consultation paper' (The Gaming Board, 2000a). Responses to the consultation letters also indicated that industry wants to see British Internet gambling legalised and regulated as soon as possible to give Britain a good position in the global market, enhanced by Britain's high reputation for land gambling.

Following an acceptance that there is a need for all gambling laws to be reviewed, Jack Straw set up The Gambling Review Body in February 2000 by announcing its terms of reference and the chairman (Gambling Review, 2000). The ten members of the body were announced in March 2000 and the Review Body began work in May 2000. It is clear from the terms of reference that the social aspects of regulation are to have equal emphasis with the economic The results and recommendations are due in the summer of 2001.

Britain is taking much longer to review the situation and gather information on the issue before making any decisions Notably, unlike the USA or Australia, there is very little debate over the issue of whether to regulate or prohibit Internet gambling, either in the public or political arena. The general acceptance seems to be that regulation is the correct path forward However, how exactly regulation will operate and who will control it remains to be seen. Also, unlike the USA and Australia, there is no tension over state and national legislation. Despite the fact that Britain is a federation, it is probable that regulatory differences will not be an issue for England, Scotland or Wales. An advantage of the process that the Home Secretary is taking is that nothing is being rushed and it is unlikely that a U-turn as seen in Australia would happen here. The disadvantage is that British operators, especially the casino operators, are missing out on opportunities and are being left behind in the race for market share.

The progress of regulation in the USA

Despite the fact that Americans constitute the highest number of Internet gamblers, there has been an intense struggle in Congress to see it prohibited. Key to the issue has been the Federal Interstate Wire Act of 1961. Under this Act it is illegal to conduct a betting or wagering business over interstate telephone lines between states where it is illegal in either or both. If wagering over telephone wires in both states is legal, then there it is acceptable The FIWA in its original state does not cover gaming. The first few acts introduced to Congress attempting to ban Internet gambling were adaptations of the FIWA. Senator Jon Kyl (Republican – Arizona) has been one of the keenest advocates of banning Internet gambling, and has introduced two bills into congress. the Internet Gambling Prohibition Acts of 1998 and 1999. However, unlike the FIWA, the first IGPA sought to ban all forms of gambling, it was irrelevant if gambling interstate was legal in both locations, it would be illegal to gamble by any device, and bettors as well as operators would be liable for prosecution and conviction (Kyl, 2000)

The IGPA, known as S 474 in the Senate, was a resounding success The Senate voted 90-10 in favour in July 1998. However, the companion bill – HR 2380 sponsored by Senator Goodlatte (Republican) – was held up in the House of Representatives, mainly due to attention by the House Judiciary Committee being switched to 'Monicagate'. This meant that the IGPA had to wait until the following year and repeat the process.

Kyl reintroduced the Bill in 1999 as S 692 It differed to the previous year as it was much longer, contained more exemptions and was tighter in meaning This time, only the businesses were targeted and not individuals gambling on the Internet However, objections were raised to the many exemptions in the bill, mainly for fantasy sports leagues, state lotteries and certain horse racing activities. Protection was also given to the ISPs in that ISPs had no liability for housing an illegal gambling site (Kyl, 2000). After minor amendments, S 692 passed the Senate vote in November.

The companion Bill of the IGPA of 1999, HR 3125, was again sponsored by Republican Bob Goodlatte. However, in this Bill the ISPs would have been prosecutable for facilitating access to illegal Internet gambling sites. There were also wide-exemptions for pari-mutuel wagering on horse and dog racing, Jai Alai and certain forms of Indian gaming There were no exceptions for state lotteries, which was extremely unpopular as, out of all forms of gambling in America, lotteries are seen as the least damaging because money is given back to the community

In the two years that the IGPA progressed through both the Senate and the House of Representatives, the aims and wording of the Act changed greatly each year and in each Bill, giving the impression of inconsistency. The *Law Tech Journal* commented that·

> The Bill has now so many exceptions, exemptions, immunities, loopholes, definitions and clarifying clauses, that it is now a misnomer to call it the IGPA. It would be more appropriately called the Federal Internet Gambling Regulatory Code (Tech Law Journal, 2000)

Another consequence of the changes and exemptions was that the IGPA changed from being perceived as an attempt by Senators Kyl and Goodlatte to protect the vulnerable and young from the dangers of easy gambling, to being an insidious attempt to save state revenues from land gambling and protecting the interests of established gambling operators to limit competition.

The House voted on HR 3125 on 17th July 2000. In this instance it needed a 2/3 majority to pass, but failed by a vote of 245 to 159. Much of the opposition to the Bill came from lawmakers and advocates concerned about federal regulation of Internet content, as well as the potential for invasion of privacy Critics also raised concerns that because of exemptions to pari-mutuel horse and dog racing, this might give rise to an expansion of Internet gambling of those industries. Some lawmakers in both parties expressed reservations about the extent of federal incursion into the prerogatives of the states. The failure of HR 3125 sounded the death knell for S 692 and, as a result, the Kyl Bill failed to go through For the 107th Congress, Senator Kyl has been uncertain that he will introduce new anti-Internet gambling legislation.

Two other Bills have been presented to Congress aiming to put a halt to Internet gambling. The first, HR 4419, was introduced In June 2000 by Committee Chairman Jim Leach (Republican) and was known as the Internet Gambling Funding Prohibition Act This Act aimed to prohibit the use of credit cards, cheques, and debit cards or wire transfers to pay for or collect winnings on Internet gambling The Justice Department would be given sole authority in seeking injunctions against financial institutions that violate the Act. Penalties could be either a fine or imprisonment for up to five years, or both After debate, the Bill was amended to allow closed-loop betting on pari-mutuel activities This, however, made the Bill almost identical to HR 3125, which had been severely criticised for its exemptions and carve outs The House Banking Committee passed the credit card prohibition by voice in June 2000, but did not reach the House floor for a final vote. The Bill is again approaching the house this year, but sponsored by Democrat LaFalce.

Similar to HR 4419 is the proposed HR 5020 by Conyers and supported by the Justice Department who are opposed to Internet gambling in any form. This Bill again proposes amendments to the FIWA as a blanket ban to prohibit Internet gambling over any communications service. There are no exceptions or exemptions, but the ISPs would again be immune from liability for the policing of the Bill (Rucker, 2000). This Bill emerges as a threat to the reintroduction of HR 3125 due to the lack of exemptions The progress of this Bill remains to be seen, however it is possible that the pendulum has swung in the other direction, and now the mood is more of acceptance of Internet gambling and a desire for regulation to ensure a slice of the global market share

International regulation

Within Europe, the general consensus between countries in gambling regulation is an issue for the individual countries to decide and individual jurisdictional regulations are to be respected by other countries. To illustrate this, Holland became the first European country to regulate Internet gambling for its citizens only. Its online casino, www.hollandcasino.nl, began operations in November 2000 from a server in Amsterdam. It is claimed by the owners that strong security features prevent gaming by minors and non-Dutch nationals (Faust, 2000b). The Gaming Regulators European Forum (GREF), which is an organisation of representatives from gaming regulatory authorities throughout Europe, has moved some way to presenting a cohesive approach to the cross-border issue of regulating Internet gambling. Essentially a forum for discussion and a central point of contact for enquiries, the organisation adopted a preliminary position on Internet Gaming in 1998 It follows the concept that it is a matter for the sovereign state, but sets down a series of common aims and guidelines for European states who wish to regulate and license Internet gambling. GREF sees it as important that Internet gambling should be subject to the same rigours of legislation as land gambling. It is also clear that if licenses are offered, the operators must be established within the territory of the jurisdiction, 'so that the operation can be properly controlled and policed' (News and Articles, 2000). In addition good practice measures should be followed These guidelines should be applied to existing forms of gambling, which have transferred onto the Internet, or new forms of Internet gambling that may evolve in the future.

For those jurisdictions that do not wish its citizens to gamble on the Internet, GREF suggested that legislation should be passed placing responsibility onto the ISPs, however as opinion has moved away from such an approach it is likely to be abandoned as unrealistic.

It is possible that GREF will move towards establishing common European legislation (rather than a single European policy) with regard to Internet and land gambling and is a direction that Peter Dean supports. He commented that, 'it's not so inconceivable that you should get a pretty good consensus among the regulators, because regulators are all doing the same sort of job' (Dean, 2000).

Global regulation

Global regulation of Internet gambling poses major questions that face all concerns to regulate the Internet itself. Westphal and Towell follow the assertion by Nolan and Gibson that the 'adoption of new technologies typically follow four stages: Early Success, Proliferation, Control of Proliferation, and Mature Use' (Westhpal and Towell, 1998). As the Internet has shown rapid growth, Westphal and Towell believe that it has entered the Proliferation phase and suggest that by the actions of several nations, indications are that Control of Proliferation is now in evidence They cite (amongst others) the examples of China requiring users and ISPs to register with the police and Saudi Arabia confining Internet access to universities and hospitals. Another method of control is demonstrated in Vietnam in which the government is the only ISP, meaning that it can decide what sites are available for use (Cabot and Doty, 1999).

These are, however, methods of controlling access, not methods of controlling content The countries cited in the above examples are not democracies, and it is unlikely that the three nations under examination in this study (and other democracies) would adopt such methods in an attempt to control the Internet or dictate to their populations what they can and cannot gain access to on the Internet.

One of the main problems that faces global Internet regulation is the issue of jurisdiction. It is unclear if a transaction (as in gambling) that takes place on the Internet should apply the laws of the destination jurisdiction or of the origin jurisdiction. Because this is such a murky area of jurisprudence, which is far from being resolved, the concept of boundaries on the Internet and its implications for Internet gambling mean that terrestrial laws will continue to be side-stepped

Another insurmountable problem for global regulation of the Internet is one of culture. What is acceptable in one culture may not be for another. This means that it is impossible for one nation to impose its jurisdiction on another as it undermines the principles of comity and sovereignty. In addition, even if all nations but one agreed to outlaw Internet gambling, the one that allows Internet gambling would become a haven for operators and gambling on the Internet would therefore continue

The only way for a global restriction on an Internet activity to be effective is for all nations to believe that the particular activity must be stamped out at all costs. This seems to be the case for child pornography in which most nations hold in abhorrence This is not the case for gambling on the Internet; many countries accept it, want to regulate it or do not believe that it is something with which they need to become involved. There is no global movement that has one direction for Internet gambling.

Even if global regulation of Internet gambling were to be enacted by some means, the question of enforcement remains This would necessitate some form of policing and the appointment of a body or organisation responsible Issues surrounding whom the members of this enforcement body should be, how it would operate and where prosecution should take place would be extremely difficult to resolve. The concept of regulating Internet gambling on a global scale therefore seems impossible given current technological, legal and cultural considerations

Conclusion

The regulation of gambling does not lend itself easily to the Internet While it is possible to control or prohibit terrestrial gambling at the state or national level because of the existence of physical boundaries, it becomes extremely complex on the Internet because of its nature. This situation illustrates that the technology of the Internet confounds attempts to stamp out activities of which a democratic government disapproves

The situation with Internet gambling also demonstrates the problems that a nation may have with the content of particular elements of the Internet. In the USA, the drive to prohibit Internet gambling could possibly fail as existing laws are inadequate to deal with the new medium and the resistance to create new prohibitory Internet laws are interpreted as attempts to censor content. Two statues of the Communications Decency Act of 1966 were struck down by the Supreme Court, which ruled that indecent speech on the Internet is protected by the First Amendment. This implication is that regulatory attempts to control content on the Internet will be prevented. Unless the USA decides to control access in the same way as totalitarian governments, there seems to be little realistic hope of prohibiting Internet gambling as Americans will want to protect their right to gamble in the same way that they strive to protect their freedom of speech.

It is possible that regulation of the Internet would be the easiest policy model to adopt, as it is far easier to control an industry rather than the Internet itself. For an Internet activity such as gambling, there is a drive to create national cohesive models This challenges established frameworks in which federal and state law are kept separate, and in itself is an issue that will be difficult to resolve. The likelihood remains though that each of the three countries will have a national Internet gambling policy of some description in place within a few years.

One of the main issues that the regulation of Internet gambling illustrates is that when an industry migrates to the Web, if it has been subject to terrestrial regulation, similar regulation is required in its new environment This is because without it, an uneven playing field emerges and the survival of established companies or operators is threatened

Conversely, competition in the new setting can be stimulated. This means that the push for new customers develops different areas of technology and business, which can have positive affects on national economy. Governments will continue to debate whether the social costs are worth these developments.

It is important that when and if regulatory controls are enacted they are not so expensive that costs are forced onto operators who then raise their prices. If they are too high, then it is possible that gamblers will simply move to unregulated sites that are cheaper, especially if they do not value the regulations in place. The effectiveness of regulating Internet gambling therefore ultimately lies with the consumer.

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Health information kiosk use in health organisations: the views of the health professionals

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A series of in-depth one to one and group interviews were undertaken with health professionals and surgery practice managers in medical locations where a touch screen information kiosk was available for use by patients. The purpose of these interviews was to provide context and understanding for the kiosk log data that was being gathered that provided data on number and length of use sessions, pages viewed and age and gender of users. The interviews were also concerned with issues beyond those raised by the logs – principally the benefits and problems inherent in providing health information 'online' and the impact of electronic information for patients on the work of the medical practitioner. The reasons why kiosks were purchased and the extent to which expectations were met were also areas of interest.

Results showed that disproportionately high use of the kiosk by children, identified by the log data, could be explained in a number of ways. Medical practitioners spoke of helping children both use the system for school projects and access pages on behalf of parents and grandparents. Inappropriate use, however, was also reported by practice managers. A number of factors cited by professionals, such as poor IT skills and cultural barriers, help explain low use by the 55-74 age group. A resurgence of interest amongst the over 74s, however, remains a mystery awaiting the next stage of the fieldwork, when patients are interviewed directly Extensive encouragement by staff to encourage patient use may account for some of the condition specific pages accessed, by all age groups.

Nurses tended to be far more pro-active than doctors, and saw many health-related benefits in referring patients to the kiosk. By contrast, doctors saw the system in very practical ways – praising its space saving potential, for example, not enthusing about its possible value to patients in health terms. Practice managers and others with responsibility for the maintenance of the system were unhappy with the extra work they were required to undertake, and complained about children 'playing' and about printer and other problems

Introduction

Digital consumer health information has arrived in a very, very big way Also, in relative terms it has happened overnight. Apart from the recent arrival of websites such as NHS Direct Online, 'Net Doctor' and 'Surgerydoor', the government are providing hundreds of free NHS touch screen kiosks for health centres, libraries, walk-in information centres etc. These kiosks are crammed full of information from ideas on 'healthy living' to details of surgical operations. Similarly, InTouch With Health, an IT company specialising in health information, has more than 70 kiosks in GP surgeries, hospitals, walk-in-centres etc. throughout the country which contain material supplied by the Department of Health, medical charities and other appropriate bodies. The subjects covered include national and local health services, medical conditions, support group contact information, healthy travel and healthy living topics. Thousands of individual topics are covered and fact sheets can be printed for each one

Despite the huge economic and political investment in digital health information provision by the government and commercial companies, there has been no national evaluation of its impact on the health consumer or on the health profession Yet this overnight phenomenon has the potential to massively impact on a key and critical aspect of all our lives Thus the Internet Studies Research Group at City University, in a project funded by the Department of Health,[1] is addressing this issue by examining the provision and take-up of digital consumer health information on a truly national scale. Data is being collected routinely from the transaction log files of more than 50[2] InTouch With Health kiosks and from in-depth interviews with both health professionals and patients in the locations where the kiosks are based Log files provide a comprehensive and detailed mapping of consumer information seeking behaviour, and in this regard data is being collected on the number of search sessions conducted, number and type of pages accessed, time spent online, and number and type of pages viewed. This data can be cross-referenced to the age (range) and gender of users, site type (hospital, GP surgery, library etc), and to socio-economic statistics related to kiosk location by postcode. However, while logs can map information seeking in fine detail and on a massive scale, the maps drawn require explanation and contextualisation – and that can only be obtained through interview and questionnaire The digital maps raise large numbers of questions but by themselves do not provide the answers to these questions Nor do they provide any data on non-users.

We have published material elsewhere on the quantitative aspects of the project (Nicholas, Huntington and Williams, 2001a) This paper specifically reports on one phase of the qualitative research that underpins the log analysis – in-depth interviews with the health professionals who are responsible for the kiosks. Their experiences in having a kiosk on hand, using it with patients or referring patients to it, and their observations of patient use are all examined, both to inform the assessment of the impact of the system in itself, and to enrich and interpret data coming out of the logs. Later in the project this information will be supplemented with patient interviews and observation.

Aims and objectives

The aims of the study were to:

- provide context and understanding for the kiosk log data that was being gathered in copious amounts;
- explore the benefits and problems inherent in providing health information 'online';
- assess the impact of digital information for patients on the work of the medical practitioner; and to
- uncover any hitherto unforeseen issues the possession of the kiosks might have raised.

Specific objectives were to examine.

- The extent to which health professionals saw patient education and information provision as an integral part of their role.
- The extent to which the kiosk was seen, before purchase, as meeting these requirements, and the extent to which expectations have actually been met.
- Other reasons for kiosk purchase.
- The displacement of other sources of information for patients, and the degree to which this has been encouraged or necessitated (by the diminution of leaflet provision, for example)
- Perceptions, observations and experience of public use of the kiosk and how these are supported or negated by the log data.
- The extent of kiosk use by health professionals themselves
  (a) to meet their own information needs, and any consequent displacement of other sources for health professionals;
  (b) in regard to mediation with patients.
- The extent to which usage data, as shown by logs, is in some way related to professional use.
- The impact on professionals' relationship

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[1] The Web, the kiosk, digital TV and the changing face of consumer health information provision a national impact study, April 2000 – January 2002

[2] This figure is likely to increase to 70 over the project's lifespan

with patients, with particular regard to the quality of consultations – were patients more knowledgeable? Is that a good thing, or does it undermine the consultant? Work load – are there any implications here? Has wider information provision for the public meant more background reading and current awareness by doctors?

- Views about issues of equality of access, difficulties encountered and steps taken to resolve these.
- Practical issues such as delegation of responsibility, technical/mechanical problems, dealing with misuse etc.

Background

The kiosks studied were developed by InTouch With Health, and sold to surgeries, pharmacies and hospitals on a commercial basis, costing around £7500 each and requiring further annual maintenance costs. They contain over 5000 pages of content with access to an additional 40,000 pages of local health service maps and listings. Subjects covered include national and local health services, medical conditions, surgical operations, support groups, healthy travel and healthy living topics (ranging from pharmacy items to healthy foods and services). A lengthy list of content providers and approvers include the NHS, the Health Education Authority, Carers Association, SCIEH (Travax), Patientwise, The Red Cross and the Royal Society for the Prevention of Accidents (ROSPA). Revenue for the kiosks is generated from sponsorship, advertising, content syndication and data sales. Apart from being an information provider, the kiosks also market products and services.

At the time of the study InTouch had installed more than 70 health information touch screen kiosks around the country. Despite InTouch promoting the kiosks nationally, they nevertheless tend to be clustered in certain parts of the country. Plotting the site locations on a map (Figure 1) produces a wide strip from the south to the north, where the extremities are poorly served, and the midlands area over-represented (partly because of an initiative in the Leicester area where a number are deployed in various non-medical locations around the city). However, kiosks are slowly spreading outwards – Cornwall has recently installed two in local hospitals Nevertheless, Norfolk, Suffolk and the whole of Wales are still without kiosks. In Scotland there are several terminals, although clustered in three cities hugging the east coast (for technical reasons it was only possible to pinpoint two on the map).

Methods

In addition to the computer logs that the present study sought to contextualise and explain, three methods were used to collect data. These were questionnaire survey, in-depth interviews and observation.

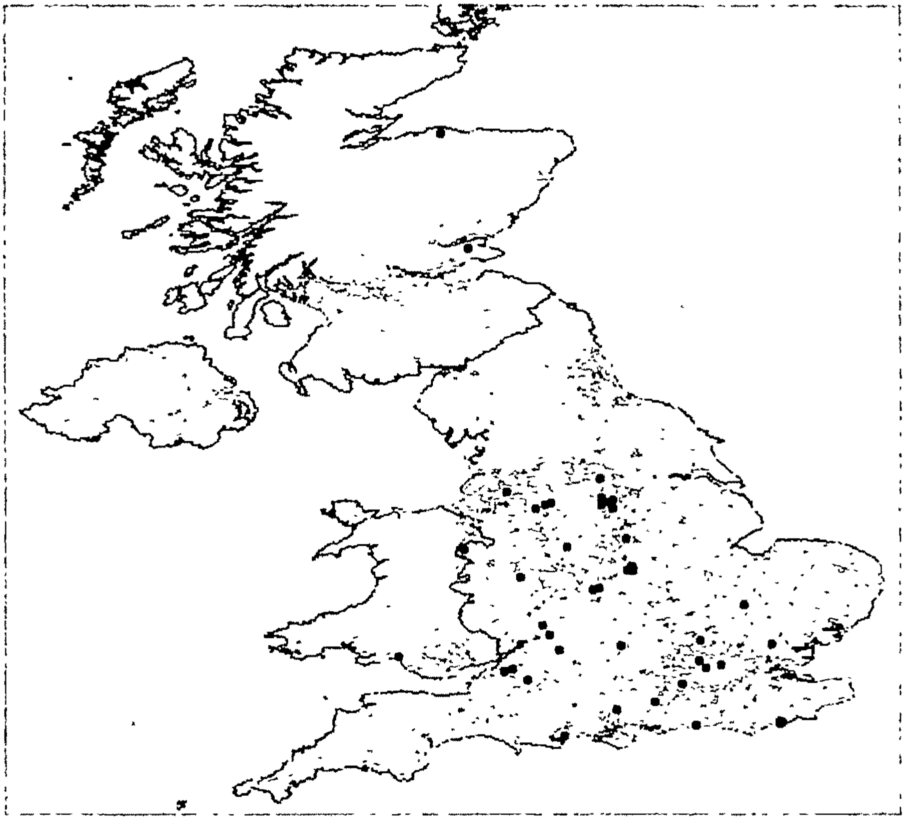
Questionnaire survey

This was administered by post to 70 sites that had kiosks at the time of the investigation, with a return rate of 63%. Questions concerned the reasons for kiosk purchase, its placement, usage rules, impression of public and staff use, and problems users had encountered. Questions related to general information provision were also asked, in order to gauge the relative importance of the kiosk in the array of information sources available to the public.

In-depth interviews

Interviews were undertaken with medical and senior administrative (principally practice managers) staff, lasting approximately half an hour Although the exploitation and opinions regarding the kiosks were the key concern both health professionals and non-users who were also invited to attend the interviews were asked for their views on increased patient information generally, and how the phenomenon of greater information provision has affected their work. Regarding the kiosk, its role in their consultations/information service was established, along with the perceived extent of use by the public, and issues such as equality of access etc., the impact of the system on the relationship between health professionals and patients, and any changing professional practices. Interviews were semi structured, with the emphasis being on what the interviewee considered important

Figure 1 *Map of kiosk locations*



Respondents were thus free to speak on issues or concerns not anticipated in the research.

Ten kiosk sites were visited, comprising six GP surgeries and one pharmacy, medical centre, walk-in centre and hospital. The locaional sample was chosen by random cluster sampling from a population of 70 kiosk locations. A site which had declined to purchase a kiosk was also visited, to add extra richness to the data. As only a small number of doctors operated at the GP surgeries, and as access to hem was constrained by time limitations, the nterviewee sample was opportunistic, with all staff who made themselves available invited o participate. The following subjects were nterviewed: 15 doctors, 12 nurses, 9 practice managers, 1 health promotion specialist, and 2 pharmacists Making a total of 39 people altogether.

Observation

Previous work on touch screen information systems has shown that log data are not necessarily wholly accurate. Naven et al. (1996), for example, found that although only 65 search 'episodes' were logged, video camera observation showed that the system was used by a total of 116 users. This anomaly is explained by the fact that, as with the kiosk system examined in the present study, if a second user takes over from someone before the computer times out the search, only one search session is registered. Observation was used in the present case both to compare observations with log findings, and also to, once again, contextualise the logs – to examine, for example, children's interaction with the system. At the time of writing, one observation session of nine hours – a full day – has been undertaken at a busy surgery in Edinburgh, and another of three hours duration at a Sheffield pharmacy. A non-participant approach was adopted whereby use was logged using a digital watch. The exact times of use, gender and approximate age were noted, and the context of the session – be it before or after a consultation, or instead of one. Although the latter may not seem likely, many members of the public use the surgery investigated simply to pick up previously ordered prescriptions.

Results

Reasons for having a kiosk

Those directly responsible for kiosk purchase tended to be senior practitioners Eight out of the fifteen doctors interviewed had some say themselves in kiosk purchase or were privy to knowledge of how the purchase came about, and all the practice managers claimed some involvement. Interestingly, the reasons stated were not as numerous – and often not as fundamental or detailed – as the benefits generally proclaimed for kiosk purchase. The main reason for this is that often it was nurses, not doctors, who trumpeted the system, despite the former being responsible for purchase Also, some benefits were not anticipated, and manifested themselves as the kiosk began functioning. Indeed, few reasons were given for actual kiosk acquisition. Considering the high cost of purchase, at £7500 (plus £350 quarterly maintenance charge), there was a very surprising lack of deep and well thought out deliberations of the issues entailed.

Reasons given were:

- a general recognition of the importance of patient information,
- the enthusiasm of a single individual committed to greater patient information provision;
- practical and/or administrative benefits;
- external offers of financial contribution for kiosk purchase.

A general recognition of the importance of patient information

Most health kiosk locations recognised that patient information was becoming a big issue with health authorities, that government plans indicated a wider role for patients in the future, and greater provision However, this appeared to be only a major factor in kiosk acquisition when respondents were presented with it as an option on the questionnaire that was sent to all kiosks. Here, 84% (33) claimed that 'concern for increasing patient information' was a 'very important factor'. In the more candid and open atmosphere of an in-depth, but fairly informal, interview situation, the rather less altruistic motivations, such as obtaining a kiosk for the minimal outlay ('we realised we could get something for nothing') were far more prevalent. Although doctors did state that information for the patient is, of course, important, it was the nurses who really considered this a priority. In fact, sales representatives at InTouch suspect that one reason for non-purchase was the fear of 'patients knowing too much, coming to consultations with more knowledge than the medics' (Birkbeck, 2001).

Enthusiasm of a single individual

In most cases the decision to purchase a kiosk appears to have been driven largely by single committed individuals and there were examples where the kiosk was not highly regarded by their colleagues. Indeed, in the case of one site, where the kiosk was bought principally because of the enthusiasm of one doctor, they returned it to the company with undignified haste the moment he retired. His leaving the practice, the indifference of his colleagues, and the thinly disguised hostility of the practice manager all conspired to sound its death knell.

Practical/administrative

The practical and administrative advantages of the kiosk were highlighted more than those advantages relating to an improved service for the patient. The benefits of extended patient information were mentioned almost as 'givens', and were not expanded upon (except by two dedicated and committed individuals). The practical advantages were, by contrast, explained in some depth. Chief amongst comments was the view that easier retrieval of information was possible. Also, the high number of leaflets that would be required to provide the same level and coverage of information afforded by the kiosk would be prohibitively expensive and administratively difficult to maintain. Several doctors mentioned time and space saving advantages. One claimed that the kiosk took up less space than 'thousands' of leaflets, and others noted the time it often took to hunt down the correct or appropriate leaflet or booklet, comparing this unfavourably with the ease with which the kiosk could be index searched and the required item obtained 'within minutes'. Doctors at one practice said the kiosk was helping them establish a 'paperless surgery'.

External offers of financial contribution

As mentioned earlier, the cost of the kiosk is not such that it can be wholly ignored. Interviewees at eight of the ten places visited claimed that without financial help they would not have been able to make such a purchase (the other two sites used fund-holding monies that would no longer be available). At five locations health authorities' offers of financial assistance proved irresistible, even for locations where there did not appear to be any great movement towards patient information or electronic delivery and no previous aspiration to improve either of these aspects of service For example, one doctor admitted: 'we hadn't really thought about patient information too much . but the health authority came round asking who wanted one of these things, and we thought 'why not" Another, a practice manager who disliked the system for the extra work she considered it to have given her, claimed 'we wouldn't have the damn thing if it hadn't been bought for us'.

Where local health authorities were not involved in part or full payment of the kiosk, the money tended to come from GP fundholding reserves where there was a commitment to provide an electronic service ('we would never have been able to afford it otherwise'), or from external sources where interest was not so keen and where, according to interviewees, it would not, therefore, have been considered Such funding took the form of charitable donations by non-governmental organisations (e.g. a hospital's 'League of Friends') or, in one case, by an individual. As noted later in this paper, there was considerable evidence that those who obtained a kiosk did not consider the full implications of their acquisition, in terms both of staff time and responsibilities and of maximising its usage amongst patients.

Benefits of the kiosk

There was some substantial difference in interview responses between doctors and nurses regarding the benefits of the kiosk, and – as the nurses were not part of the decision making process – many were not factors in deciding whether to purchase the kiosks The former tended to concentrate more on practical issues – space/time saving, easier access to information etc. which became major reasons to install the kiosks, whilst the latter pointed to the medical benefits patients might accrue These benefits can be broken down into three types:

- enhanced information provision;
- improved information currency;
- intrinsic benefits.

Enhanced information provision

The most important aspect of kiosks here is that they are seen, particularly by nurses, as an educational service to complement other available materials Thus, patients were encouraged to both use the service independently and as a complement to the instructions or advice offered by the health professionals. One nurse pointed out that it was not possible to go through all the details of treatment, recovery etc. in a consultation, and that kiosk information emphasised the major points This was described as particularly important when patients need an operation

Secondly, as mentioned above, the kiosk was said to provide more customised and problem specific information provision than hard copy. Similarly the depth and breadth of information provided was far more than leaflets could provide Finally, printouts from the kiosks served, as with information leaflets, as a patient *aide memoir* This was considered as being of great importance. As the nurses stated from their own practical experience, retention of orally transmitted information is generally poor. Medical research confirms this anecdotal view. Kitching's (1990) studies show that patients generally forget half the information provided to them within five minutes of leaving a consultation Having a written document to take away clearly should go some way to remedying this situation, although, of course, a formal examination of the advantages of kiosk printouts would require a study of its own

Interestingly, the benefits of providing this information were all *re*-active, referring to managing an existing condition, rather than preventing one (as 'Healthy Living' pages on both SurgeryDoor and NHS Direct were designed to do). The information was said to give patients control over what was a pre-existing condition, which in turn helped them manage it better, facilitating more self reliance. Some hoped that this would lead to a reduction in re-consultations, relieving the overloaded system, although no such effect had in fact been noted. Surprisingly, no one mentioned any possible benefits of the kiosk in terms of disease prevention.

Information currency

Nearly all of the kiosks are networked, so there is a facility to add, remove and update information. Indeed, one of the selling points was the possible inclusion of a health alert service, whereby current health issues could be highlighted and explained (at the time of writing this might for instance cover the possible dangers of foot and mouth related funeral pyre smoke). However, to date this facility has not been used, although the new generation of web enabled kiosks currently being introduced later in 2001 are incorporating such a feature. With the standard kiosks information is updated every three months, unless an urgent modification of information is required. Apart from one practice manager, who complained that the kiosk should have been updated far more frequently ('look at the number of health stories people need up to date information on – it's a golden opportunity to keep people informed wasted'), interviewees appeared to be very happy with this frequency of updating.

Apart from the advantages of having up to date information provided automatically there was a feeling that the system may be more reliable than leaflets in informing patients This is because, although hard copy literature was often replaced, some copies of earlier versions were not always removed from display· 'some leaflets get lodged behind new stuff, and it's, frankly, a nightmare sorting it all out and making sure everything is the latest version'

Intrinsic benefit

The intrinsic benefit of the kiosk was that it fulfilled the same function as leaflets in being a 'gift' for the patient. Not only were the patients happy to accept this token, but referral to the kiosk, or a kiosk search on behalf of the patient, served as a signal that the consultation was terminated. Doctors were quick to point out the advantages of this – being ever conscious of the time element – although an astute practice manager also mentioned this. Of course, there were intrinsic benefits also in that the kiosk represented a symbol of both the high regard for patient information (and, as a logical extension, of care) and information content in maintaining a healthy lifestyle.

Use of the information kiosk

Professional use

As mentioned earlier, the kiosks were principally provided for use by the general public, rather than the health professional. However, the researchers were interested in exploring the impact in global terms, and this meant examining whether professionals did use the kiosk for their own information needs and also whether – and to what degree – they did so in an intermediary capacity on behalf of their patients. We were also interested in the extent to which they referred patients to it Apart from being of importance in itself, it was hoped that such data could be compared with the use patterns as elicited by the logs, to see if greater involvement by health professionals lead to a higher or deeper use generally The most obvious link here would be the degree to which medical professionals referred patients to the system and the extent of use.

Use for professionals' own benefit

Use for the benefit of the health workers themselves or for their jobs was higher than may have been expected. There was a discrepancy between nurses and doctors, with the former being by far the bigger users. A number of information needs were described; by nurses the principal enquiry being for holiday vaccine details. The kiosk provided more current information than leaflets, and this type of information was always in demand. Other uses were more personal – one nurse needed information about a family member's (unstated) medical condition; another often consulted it for local information such as the addresses of local support groups, and a third for 'any additional information that will help me inform patients better'

By contrast only one doctor of the 15 interviewed indicated any personal use of the kiosk and he was the doctor instrumental in its purchase and was therefore already a committed user. He said he had cause to consult it on various occasions. As an example he described a women who wanted to donate her body to medical science He (perhaps surprisingly) found out how to do this on the kiosk. He was quick to admit that doctors 'didn't know everything', and that it was a good thing that the public were aware of that and consequently that those in the medical profession sometimes needed to consult various sources for information. He was quick to point out, however, that this was not the reason why the kiosk was purchased, but a positive bi-product.

Many other doctors had never even looked at information on the kiosk. One even admitted that 'I never even read longer NHS leaflets either – they're bound to say the right things, and I don't really have time for all that' It is, perhaps, not surprising, therefore, that the reasons proffered for non-use of the kiosk were so few and so superficial. The time pressures mentioned so often also explain the lack of genuine engagement with the system by doctors.

Degree of referral of system to patient

Referral of the system to the patient takes two forms. Firstly, the health professional can indicate orally that the patient may find appropriate information on their condition on the system and direct them to it. Secondly, the patient can be given a written 'information prescription', described later, for use in retrieving information from the kiosk

There was a marked difference generally regarding the referral (be it oral or using written chits) of the patient to the kiosk, as with other issues, between opinions and practice between doctors and nurses The latter were far more likely to refer patients to the system than their doctor colleagues Although doctors at one site felt 'obliged' to refer patients to it as they were trying to create a 'paperless surgery' and were reducing the number of leaflets stored. Only one other doctor indicated that he specifically referred patients to the system, whilst the others generally felt that patients 'knew it was available and made their own choices'. One doctor claimed he used to talk to patients about their information needs and how the kiosk might help them, but that he found it 'far too time consuming'. Another said that as there was no guarantee patients would 'rush out and look at the kiosk as advised' there was 'little point in referring patients to it' By contrast, nine of eleven nurses mentioned this practice Ironically, one of the reasons given was that 'left to their own devices' many patients would not use the system. In summary, the reasons for patient referral were given as·

- to encourage use (both to become better informed and because 'the system is there, costing money – the patients should use it'),
- to encourage a greater involvement by the patient in their own condition and treatment;
- to save nurses' time in not having to hunt for leaflets

Interestingly, the kiosk system developers – InTouch – regard the referral of patients to the system by doctors as very important in maximising use of the kiosk and, thus, helping to better inform patients generally. To encourage this the company have produced what they term 'Patient Information Prescription' (PIP) pads, alluded to above. These are chits of paper on which doctors' write key words relative to a patient's condition, which they can use to retrieve information from the kiosk These were, unhappily for the company, almost universally ignored. Of all the interviewees, only one doctor used them. Nurses indicated that they would do so, but they were either principally deployed on doctors' desks, where practice managers had put them and they had been left untouched, or were hidden away unused in someone's desk or cupboard Five nurses were totally unaware of them until the researcher mentioned their existence

The reasons for non-use of PIPs amongst doctors were almost exclusively practical. They can be broken down as follows:

- Time was the predominant reason given. With between only seven and eight minutes consultation time per patient many doctors felt prescribing information sources did not constitute the optimum use of time. Interestingly, however, medical research (MacFarlane et al., 1997) suggests that providing information, at least in the form of a leaflet, can result in a lowering of re-consultation figures, clearly easing the burden on general practitioners. MacFarlane investigated the impact on re-consultation rates of providing a leaflet about respiratory tract symptoms. Seventy-six GPs studied 1014 patients suffering from lower respiratory tract problems. Half of the patients were randomly allocated to receive an information leaflet at the end of the consultation. Significantly fewer patients who received the leaflet (75/505; 14.9%) returned to the surgery within one month compared with those who did not (107/501; 21 4%; P = 0.007) The same benefit was found for 723 (72%) adults treated initially with antibiotics: 16% (60/369) in the leaflet group returned compared with 23% (81/354) in the no leaflet group. Similarly, our own surveys of health website users appear to indicate that information can substitute for a medical consultation (Nicholas, Huntington, Williams and Blackburn, 2001) Online questionnaire respondents, surveyed on the InTouch website 'SurgeryDoor', were asked if they ever used information found on the Web as an alternative to seeing the doctor Twenty-seven per cent of the 1068 responses confirmed that web information had indeed replaced such a visit. This is plainly very significant data indeed, with self-help being one of the NHS's goals in providing information
- There was no guarantee that patients would use the information, a fact also said about oral referrals to the system. This is because the medical professionals did not have control over the patients' receipt of information, unless they accompanied them to the terminal. Leaflets were said to be preferable here, as the GP oversaw delivery to the patient.
- The idea of the kiosk was to create the 'paperless office', to manage information provision more efficiently, and the PIPs would, obviously, partly negate this objective – the chits would clutter the surgery and end up as rubbish

As an illustration of the lack of use of PIPs pharmacists in Sheffield explained that the PIP pads had been placed in 12 surgeries in the vicinity for use by doctors to give to patients for kiosk use at the pharmacy on collection of their medical prescription. In one year of its existence only one PIP has been received by pharmacists from patients bringing them from doctors' consultations

Use by the public

Much log data has been accrued by the researchers on kiosk use (Nicholas, Huntington and Williams, 2001b). Whilst a full understanding of the context and rationale for public use of kiosks has to await the start of patient interviews and surveys constituting the next phase of the research, some of the log data can be interpreted in the light of interviews with GPs' nurses and practice managers. They were asked for:

- their own observations of kiosk use;
- their perceptions of use based on comments and queries from patients;
- the possible use in consultations of kiosk printouts

They were also asked questions that related to features of the log data such as their specific experiences of children using the kiosk, in the light of findings suggesting high activity amongst under 15s, a group for whom the kiosks were not specifically designed for.

As can be seen from the log statistics regarding age in Table 1 a number of points arise. These include over representation by children (31% of users), under-representation by the 55-74 year group, and surprisingly significant use made by the over 75s. These points were all raised in interviews, and are discussed below.

Table 1 *Kiosk use by age (%)*

Age groups	Kiosks	General population
Under 15	31.3	19.1
15-34	28.7	26.9
35-54	22.5	27.5
55-74	9.8	19.2
75+	7.7	7.3
Number in sample. 116,647		

Use by children

There is much debate about kiosk use by children. Log statistics indicate that, at 31% of users, the under 15s are by far the biggest user group. This raises several questions about motivation for use, the kinds of information accessed and the use made of it. Firstly, however, it asks questions as to the veracity of the log data – after all, many of the under 15s in the population as a whole are also under 10, or even under 5 – clearly, not even the most liberal of commentators could suggest that anyone under about 8 years old would use the system in any meaningful way or gain much benefit out of it. Despite this, observational data showed that children younger than this are drawn to the kiosk – one child was able to tap the screen only by raising her hands above her head, but although this action was logged – her mother had already logged in – it can hardly be said to be meaningful. Also, the possibility of such a user happening to touch the correct log-in area and blindly giving correct age details is highly unlikely.

Whilst it might (or might not) be true that many young adolescents are pre-occupied with their health it may be considered unlikely that 31% of kiosk users come exclusively from the 10-14 year age bracket. One factor emerged from interviews that may explain the figures. Several respondents suggested that age statistics might be unreliable because many users enter details for others – specifically those for whom they are making enquiries. Thus, it may be that parents enter the age of their children when using the system. It is reasonable to suppose that these might include predominantly young children or, as mentioned later, the elderly. More than one interviewee suggested that the requirement to enter age and gender details may cause some users to assume that information provision was then tailored to the needs of the particular group entered. Later interviews with 'end users' (i.e. patients themselves and other interested members of the public) should shed some light on this possibility. It is worth noting that other research by the authors (Nicholas, Huntington, Williams and Blackburn, 2001) has shown that there is a considerable amount of searching on behalf of other people (or, 'intermediary searching') in the health field. According to respondents of the online questionnaire mentioned earlier, almost one in two (48.3%) searches conducted were undertaken on behalf of someone else. 16.5% went to the Internet looking for information for a partner, 15.5% for a child and 13.8% for a relative.

With regard to actual use by the young, rather than on their behalf, there was a clear distinction between the views of medical personnel (both doctors and nurses, who offered similar accounts in this case) and practice managers. The latter were almost universally negative, with a common comment that children often 'play', but rarely used it correctly. At one surgery it was reported that even very young children had been seen using it, doing so by standing on chairs in the waiting room to reach the screen. Of course it is possible that early contact with the kiosk – even if not directly meaningful at the time – will lead in time to meaningful use. Perhaps playing with the kiosk constitutes a form of digital ice-breaking?

The most popular pages accessed by children were, according to virtually all respondents, travel pages 'simply for the animation'. Some evidence supporting this is available. The most popular ten pages retrieved by children do in fact contain three travel pages (Brazil, Egypt and Cape Verde), all of which contain cartoons and other graphics, whereas such pages are not as popular with the 16-34 age group. On the other hand, a common comment, made by no fewer than seven of the nine practice managers interviewed was that 'children love the sex pages', something that is not borne out by log data, which did not register any entries that could be even remotely related to this topic. The 'top ten' pages chosen by children were:

1. Good eating
2. Exercise
3. Alcohol
4. Brazil
5. Asthma in childhood
6. Weight
7. Cape Verde
8. Cancer prevention
9. Enuresis
10. Egypt

The good eating entry will plainly warm every parent's heart and that for the Cape Verde islands will please geography teachers everywhere. There does appear to be some evidence, albeit slight, here for the assertion that some users enter the details of the person for whom they are searching. Arguably, one could say that children would not be worried about cancer prevention (although asthma may directly affect a large number) and it may be parents looking for information on these topics for their children and logging in using their children's details. Similarly, it is unlikely that children under 15 would be familiar with the term 'enuresis' – indeed, many of their parents would not However, the term 'bedwetting' also accesses the page entitled enuresis, and one could argue here that it is, indeed, the children themselves consulting the kiosk – perhaps surreptitiously.

There were complaints about children other than the apparently misguided one that they accessed inappropriate pages. One practice manager complained that use by children could prevent adults making enquiries Both the formal observation exercise and casual observation whilst visiting other sites (being shown around, waiting to be seen by an interviewee etc), however, suggested that this is a harsh assessment. At no site visited was there any queue to use the machine. Indeed, at the Sheffield pharmacy there were only three users over a four-hour period and in Edinburgh seven users in eight hours. Of course, although not stated, the practice manager who made this comment could have been thinking of the effect on adults of children's use, with potential users possibly considering that the system was not for them, as the user group appeared to be so young

Despite these somewhat negative views, however, few sites had introduced rules to prevent or control child use. Those mentioned were prohibiting use by the under 12's at one site, and ensuring that children are accompanied by an adult at another, although staff try and take a relaxed attitude towards this, unless children are being raucous or preventing adult use. One other site made a positive decision not to impose rules, as this might prevent genuine enquiries, by pregnant teenagers, for example, or abused children.

Health professionals were far more positive overall about children's kiosk use. A nurse at a walk-in centre claimed that children used the kiosk to research homework tasks, and there were also various suggestions – principally, again, from nurses – that children helped both their parents and grandparents use the system (an interesting intermediary model) One respondent also remarked that even youngsters supposedly 'playing around' on the system was at least indicative of some engagement with health information and quite possibly some absorbing of it.

Use by the elderly

As can be seen from Table 1, there seems to be something of a discrepancy in the computer logs regarding elderly use. Use by the 55-74 year sample is a great deal lower than would be expected by figures for the general population – users representing less than a half that which would be expected proportionally However, use by the over 74s was higher than would be expected – much higher, in fact, when one considers that many elderly are bedridden or otherwise incapable of standing next to a kiosk (as are many under 15s!)

Ironically, nearly all the health professional's comments regarding elderly use were made with the initial assumption that there was an under use by this group (there was, indeed, under representation of the 55-74 age band), and several possible reasons were advanced as to why 'elderly' people, generally defined by respondents as being 65 plus, may not take full advantage of the kiosk. When confronted with data showing an apparent resurgence of interest over the age of 74, respondents were most surprised, although many possible explanations – which the patient centred fieldwork will examine – were forthcoming

Considering the under-representation first, the following factors were cited

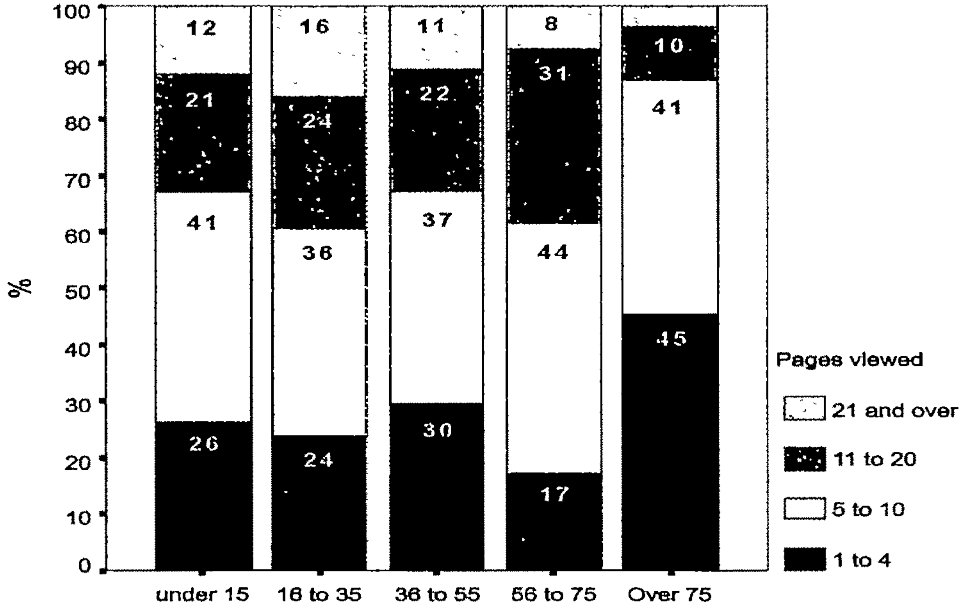
- unfamiliarity with IT;
- cultural factors,
- health factors.

Unfamiliarity with IT Many respondents (more than 50% of both health professionals and practice managers) unsurprisingly cited this possible factor, although (significantly) no-one offered any evidence to support this (in the shape of elderly patients seeking help or expressing dissatisfaction that a system had been introduced that they could not manage).

Cultural factors It was argued that professionals such as teachers and doctors were exalted figures when today's 65 plus age group were children, and there was a feeling that this inhibited the desire to search for their own information, in the sense that this might undermine the authority figure of the doctor. Similarly, the elderly might not think it 'their place' to look for their own information. Indeed, many doctors indicated that, from their experience, for many older people the only information that mattered was that provided 'first hand' from (in this case) a doctor. There may also be an element of fatalism at play, whereby those over (say) 65 or 70 regard themselves as having been lucky or blessed or sensible enough to have reached that age, and to go hunting for health information that may well advise them to change habits would not be worth the effort.

Health factors. There are several reasons for considering that health may itself be a factor in the non-use – or under use – of the kiosks. Firstly, many suffer declining vision with age (Marwick, 1999). If those with poor vision used a finger to guide their eye when reading, this would inadvertently activate the system to retrieve an unsolicited page One can imagine

Figure 2 *Number of pages viewed by age*



a user desisting after two or three unexpected and unwanted page retrievals have occurred. This may be why the average number of pages viewed by the over 75s is minimal – a point which has serious implications for their take up of services, and which log data has highlighted.

Figure 2 shows the average number of pages viewed across the age bands. Those aged over 75 recorded the smallest number of page views per session. On average this group viewed about 5.6 pages – just over half the average number of pages viewed by the 16 to 35 age group, and this is indicative of a very low information intake. This is because the menu hierarchy of the system means that one has to negotiate at least four screens to arrive at an information page – and sometimes five.

Secondly, many older people may find it difficult to stand for long enough to effectively use the kiosk. None of them would be at a height for use when seated. Logs are informative here too. The over 75s recorded an average session length of about 44 seconds, a far smaller session length than any other age group and under a quarter of the session length recorded by the 56 to 75 age group. The average page view time of 8.90 seconds by the over 75 age group was just under the page view recorded by the under 15 age group.

The reasons cited above would all, it seems, be exacerbated with age. It was therefore with some surprise that interviewees discovered that, according to log statistics, those over 74 were not under represented at all, except in terms of the number of pages they retrieved. Explanations for this were:

- younger users searched for older relatives/ friends and input their ages, erroneously thinking customised data would be retrieved – surely a telling point,
- children mischievously input incorrect ages, and tended to opt for the extreme age range;
- the elderly are far more frequent visitors to the surgery/hospital, resulting in inflated figures for use.

Interestingly, only one of the explanations offered made the assumption that the log statistics did, indeed, reflect the true user numbers, and only one respondent (out of 15 to whom this information was put) offered this explanation. Others gave the other two explanations, where, in both cases, searches were undertaken by proxies. Internal formal observation by a local researcher in two kiosk hospitals for questionnaire surveys (Nicholas, Huntington, Williams, and Vickary, 2001) tends towards the latter – such low use of the kiosk by the elderly was seen, that only four respondents over 74 years of age, out of 174 in total, completed a personally distributed questionnaire. Clearly, the planned fieldwork with groups of patients will go a long way in determining the true rate of elderly use of the system.

Gender related usage

Interviewees tended to believe that female kiosk use was far higher than that for males, although this assumption was not borne out by the log data. This showed that women represented just over 52% of users (Table 2) – a statistically insignificant difference in use as compared to males. The amount of use, in terms of session time and pages viewed, were also similar, by gender.

Table 2 *Kiosk use by gender*

	Kiosks	**General population**
Female	52.2	50.7
Male	47 8	49.2
Number in sample: 116,647		

Higher female use was expected by health professionals because:

- women tended to visit the surgery more often than men;
- they were far more likely to accompany their children;
- they were more interested in health;
- they tend to assume the role of family carer and as such had responsibility for their families' health care.

It is perhaps no surprise that respondents regarded females as the biggest users of the kiosk – much previous research points to greater involvement by females in health information In the authors' own study of the use of a commercial health information website

(Nicholas, Huntington, Williams and Blackburn, 2001) no fewer than 80% of respondents were female. Eysenbach et al (1999) found that health and medical content 'seems to be one of only a few categories online that women are more likely to use than men'. Similarly, the Health on the Net Foundation (HONF, 1999) found in an online survey of health information users that women made up 64% of North American respondents. In a wider context, Corney (1990) points out that women's rates of utilisation of almost all health care services are higher than men's, and suggests that general practice surveys endorse these findings with women attending more frequently, particularly in the child bearing years Women also have a major role for health care in the family Norcross et al (1996) have undertaken work showing that women in the home do exert much influence on men's health advice seeking.

Observational data showed that women were indeed the predominant surgery users at least on the particular day the location was observed.We are researching this issue further.

Impact on work

This appears to be minimal. Even the practical advantages mentioned of having an electronic information source did not seem to translate into any great shift in the working practices of health professionals, except in one respect. This was the general increase in health knowledge exhibited by many members of the general public – and, even here, the presence of the kiosk in itself may not have been a big contributor. The general feeling was that this greater awareness had made a positive impact on work It was easier now, for example, to explain the specifics of an individual's situation within the broad range of a particular condition that they might have information about. One doctor felt more comfortable with this situation, as he could negotiate a care package with some of his patients – as the care plans were thus the result of shared decision making he felt the burden of responsibility was lifted from his shoulders.

Unlike reports in the popular press (e.g Rumbelow, 1999) there was no suggestion that this situation undermined the work of the professional Only two doctors mentioned problems in this respect, one with regard to the Internet, where she felt she occasionally had to 'waste valuable consultation time' by explaining why a piece of Internet acquired information was not correct or appropriate The other complained of 'half heard or understood' fragments of information from the television or 'half read' magazine articles.

Interestingly, the two pharmacists interviewed showed even more enthusiasm for the kiosk in terms of the way it had effected their work Both felt it had enhanced their job roles. This was because they were now able to answer more queries from the public and be more pro-active with them in information seeking and, from there, advice and support.

Problems and issues

Several problems and issues arose from the interviews, ranging from doubts about information content to unhappiness over responsibility for kiosk maintenance Three respondents mentioned an unease with the kiosk in terms of information quality. Two of these gave specific examples of inaccurate information In addition to their concerns for patients, they were particularly worried about the legal implications for providing information. There did not seem to be any awareness of what these might be No one seemed to know where responsibility lay with regard to public use of information sources not directly supplied by professionals A lack of informed policy on the dissemination of kiosk information with regard to possible liability was also very evident

Information content

There was a feeling that the information content was 'too variable', with one respondent indicating that for some conditions (such as dyslexia) information consisted 'merely of an address from where a leaflet could be obtained'. Others, by contrast, 'provided very detailed information written at a level that may not be accessible to many people' Perhaps surprisingly, practice managers were particularly critical here. Four respondents – all health professionals – mentioned missing information One acknowledged that the topics she searched for were very specialised and would not be expected on a system primarily for use by the lay public. At one site a formal list is kept, and InTouch With Health often contacted about missing information As mentioned, the potential for information updating was very popular amongst the interviewees, and it was not surprising, therefore, that there was a certain dissatisfaction at what was perceived as a lack of initiative on the part of the information providers to do more to provide a more current service that reflects issues of the day. InTouch are, in fact, addressing this, by bringing out a web enabled touch screen later this year (2001) which will incorporate health 'headlines' and other features that will give the system the currency possible with the technology. This should make a big difference.

One of the advantages of the digital environment trumpeted by InTouch is that of the facility for surgeries etc. to provide their own customised local information on the system. This did not turn out, however, to be a big priority or big issue with purchasers One respondent said staff did not have time to put local information on the kiosk. This appeared to be an almost universal problem. Another problem was that the process was, for at least one location, far from intuitive. Having 'played around' with the system, no one was able to actually 'figure out' how to upload material. InTouch had sent a series of floppy disks with the instructions on, but this had not really helped Of the fieldwork sites, only those that were able to count on volunteers, or an outside organisation, made use of this facility. Interestingly, the sites, which did do so, valued this very highly. Questionnaire returns showed that 31% (24) of respondents made use of this facility.

The facility to incorporate local information on the kiosk has been exploited to the full at one location The main element of this has been a local health directory, where the term 'Health' is used in its broadest sense and hence covers: sports centres, community centres, gardening clubs, scout groups, GP practices, hospital clinics etc This is a comprehensive information source, which is authenticated against details provided by organisations listed, and is constantly updated. A local newsletter is also uploaded regularly.

Equality of access

This is, of course, a big issue, and one that the government has considered carefully in its drive to digitise services. Interestingly, apart from substantial references to the elderly, discussed above, little consideration was given to user groups who may find access/use of the kiosk difficult. This is unfortunate, as the computer logs are only able to detect age and gender characteristics so nothing can be inferred from this data about usage by people on the basis of other characteristics – such as educational ability in general, command of English or mental condition. Only two sites expressed concern about readability Running some of the pages through a readability checker (on Word) indicated a wide variation in levels, with some of the pages coming out on a Reading Ease score as 'difficult' – the equivalent of undergraduate level reading Thus, even native speakers of English may have difficulties in using the system. Those for whom English is a second language might be further prejudiced. This issue is, therefore, of more than academic interest – and is partly being addressed by the introduction of kiosks for specific ethnic groups

Nurses at one site made judgements on the basis of the patients' spoken English (including the abilities of both native and non-native speakers) and general demeanour as to whether it would be appropriate to recommend the kiosk or retrieve information from it on their behalf. At the other site an interviewee (also a nurse) expressed concern about the implications of differing information take-up according to factors such as educational ability. As with the elderly, it was often those who needed information and guidance the most (even if they themselves were not aware or worried about this) who were not receiving it. At one pharmacy visited, staff made sure they both encouraged use generally One in particular was at pains to help those who she felt might not be able or willing to use the kiosk, for whatever reason.

Interestingly, and perhaps worryingly, no one mentioned particular problems that either physically or mentally disabled people might face in accessing digital information A cursory glance at the kiosk, however, indicates many potential problems that those with a disability might face. Firstly, the kiosk can only be accessed from a standing position, immediately precluding unaided use by the wheelchair bound and those who find standing for any length of time difficult. Secondly, despite the larger font size on the kiosk than on the corresponding website, the screen may be too small for those with a visual impairment. The choice of white lettering on a pale green background does not help here.

Allocation of responsibility
This was a big issue with the practice managers, who were *de facto*, charged with the day to day running of the kiosk. This caused some resentment, with some complaining of the extra workload the kiosk occasioned One practice manager complained that she was often required to stay on duty after their normal hours to be available when the engineer called – apparently a frequent occurrence Other problems arose from lack of delegated responsibility or refusal to take charge:

- The paper tray was often not replenished. Sites where use has not shown a steady decline after an initial peak had indicated in telephone interviews that, far from being a sign of continued interest in the kiosk, the failure to obtain a print-out of a desired page made users return on a second or third occasion to acquire the document.
- The paper index of contents was not updated (the kiosk comes with a ring binder which includes all contents lists). When the information is updated online, sites are sent the paper versions of the updated pages to put in this and discard the previous entries).
- The kiosk appearance suffered – cleaners only undertook a cursory 'wipe over', leaving cleaning with proper cleaning solution to volunteer patient participation group members Concern was expressed that the 'shabby' appearance deterred use
- Calibration of the screen was not undertaken as often as necessary The calibration of the kiosk is of major importance, as the retrieval of correct pages depends on a correct alignment between finger and screen[3]

A lack of time and only informal delegation of responsibility may also have been instrumental in the lack of local information uploaded on most systems.

Technical and mechanical problems
Printer problems – in the form of jams, connection failures and paper shortages were the cause of most of the difficulties experienced with the kiosk. Multiple printing was a major bugbear. The printer does not quit a job when it runs out of paper, nor does it warn users, who press the print command several times before giving up The printer then clears the queue when it is replenished. The emphasis placed on problems of this type by practice managers contrasted sharply with the perceptions of the system given by health professionals, who were not involved in managing problems of this sort and, it appeared, were often unaware of the difficulties their staff faced.

Conclusion

Several interesting points have arisen from the fieldwork. Firstly, the data generated from the interplay between log findings and interview comments have highlighted the importance of both these methods being employed in investigations of this kind. In several cases the logs appeared to negate the preconceived ideas held by interviewees (the lack of a significant discrepancy between male and female use for example), belying the perceptions of professionals on the ground In certain cases the findings from the quantitative and qualitative elements showed how, rather than providing conflicting results, one could inform the other. This was clearly the case with respect to surgeries showing a continuing or increasing usage level. Interviews indicated reasons for this phenomenon (in the shape of greater proactivity than at other locations, more involvement by nurses etc.). Finally, regarding the log-interview combination, a number of questions emerged from the former requiring further qualitative examination Predominant amongst these were two findings related to elderly users. Firstly, something of a mystery surrounds the usage, in terms of user numbers, by the over 75 age group. Secondly, there is a need to investigate the reasons why this group tend to access so few pages that they fail to move beyond the menu hierarchy.

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[3] A new policy by the kiosk providers of kiosks audits should address this

Of particular interest regarding the qualitative research in itself may be the differences in outlook and practices between the three staff 'players' at the kiosk locations doctors, nurses and practice managers. The differing views between doctors and nurses is of much importance, as the degree of pro-activity regarding kiosk use appears to be a strong factor in its take up by the general public. An editorial in the *British Medical Journal* (Smith, 2000) describes the divisions between doctors and nurses as including sex, background, philosophy, training, regulation, money, status and intelligence. Perhaps, therefore, it is not surprising that their views and experiences of the electronic information system may be so very different. It may also be expected that nurses appear to engage more with patients. Research shows that when nurses do the work of doctors, it is often to the greater satisfaction of patients (Shum et al., 2000). Similarly, nurse consultation over the phone can safely reduce hospital admissions for both adults and children (Lattimer et al., 2000) and that there is evidence of high levels of satisfaction with the nurse-manned NHS Direct telephone service (O'Catham et al , 2000) All of this research seems to point to very high public regard for nurses, and indicates a certain receptivity for any suggestions by them with regard to information seeking from the kiosk or otherwise. By contrast, whilst nurses appear to be gaining in public esteem, doctors are, apparently, losing their's. A report from the BMA (2001), published as the final draft of this paper was in preparation, claimed that:

> Family doctors are demoralised. They are angry that despite ever increasing hours of work and coping with an agenda of constant government-imposed change, they are often not able to give their patients the service they deserve.

Similarly, studies have reported poor records of doctors in perceiving patients' underlying worries, (Stewart et al., 1979) and have trouble in recognising those seeking support (Salman et al., 1994)

Time constraints, an issue connected with the comparative work of doctors and nurses, was a major factor determining employment of and attitudes towards the kiosk. Whilst research (e.g. Shum et al., 2000) indicates that patients express greater satisfaction with professionals, be they nurses or doctors, who spend longer over their consultations and give them more information, doctors just do not have that time to give hence their lack of knowledge of kiosk information content, non-use of Patient Information Prescriptions or other referral of patients to the system.

The difference between health professionals' and practice managers' views was also important. There was a clear problem for the latter at many locations – exacerbated by printer and other malfunctions – regarding staff responsibility and delegation, and some resentment that the kiosk had resulted in extra work for them It is possible that this led some practice managers to talk negatively when describing use by children. This is in contrast to the way the kiosk was seen by health professionals, none of who mentioned any of these issues.

In conclusion it can be said that many factors appear to be important in the installation and use of a health information touch screen kiosk, such as the degree of commitment and involvement of the players involved, in the shape of doctors, nurses and practice managers. This study has also shown how the integration of quantitative data from computer logs can be integrated with qualitative fieldwork to inform and enrich findings In this case they helped to reinforce or refute the opinions of interviewee perceptions and, by contrast, also raised the questions that need the contextualising data of the in-depth interview to tease out the reasons for activities exposed by the digital footprints of the logs

Finally, it is of course still early days in what is turning out to be a truly massive roll-out of digital health information services to consumers, and things are changing rapidly as we write this article. Two developments in particular are worth briefly flagging which show every sign of boosting the popularity of kiosks with health authorities and changing the attitudes of health professionals Firstly, the first web-based InTouch With Health kiosks are due to appear in the autumn of 2001, starting with maybe as many as 20 in the Oldham health area. These kiosks provide for a wider range of health information and improved currency. Furthermore the Web has a stronger appeal amongst health decision-makers. At the same time kiosks for specific ethnic groups are being rolled-out. The signs are that these new kiosks are proving politically attractive and may help overcome some of the financial concerns that health authorities have about obtaining kiosks for their clients.

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End-users in academia: meeting the information needs of university researchers in an electronic age

Part 1

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This paper is the first part of a two-part paper, which examines the transition to the electronic information era in academia. Seeks to establish from the published literature to what extent university researchers have accepted, and adapted to, the changes wrought in information activity by seemingly endless technological developments. Within the wider context of the impact of the changing information environment on each of the three clearly discernible components of academic research (the creation of knowledge and standards, the preservation of information, and the communication of knowledge and information to others), disciplinary-rooted differences in the conduct of research and their influence on information needs are identified, and the resulting inter- and intra- individual variations in researchers' information seeking behaviour are explored. Reviewing a large number of studies investigating the integration of electronic media into academic work, an attempt is made to paint the picture of academics' progressively harnessing the new technologies to scholarly information gathering endeavours, with the expressed hope of affording some insight into the directions and basic trends characterizing the information activity of university faculty in an increasingly electronic environment

Introduction

The essence of research activity, the creative thinking of the researcher aimed at contributing new knowledge and understanding, has remained basically unaltered throughout the centuries. The research environment and the research process, however, have been undergoing, for quite some time now, dramatic changes, with the advent of innovative information technologies and their ever-growing utilization for scholarly purposes. The background facts are too well-known to need much elucidation: by the beginning of the third millennium we are in danger of drowning in a sea of information (to use the expression which, although by now a commonplace, if not a platitude, nevertheless best encapsulates the situation), despite the fact that this over-abundant supply of information is more accessible than ever in terms of scope, speed and ease. The computer-aided accumulation of data allows for the ongoing creation and easy management of a dynamic, growing knowledge base, which is so wide-ranging, that it is all encompassing. Seekers of information have at their disposal an unprecedented array of information resources, which include library catalogues, online and CD-ROM databases and the enormous variety of formal and informal sources on the Internet. So much so, that the sheer volume of relevant information available can sometimes be overwhelming even for academics, who need to keep abreast of the new and key research in their subject area, and although computer applications can be of immeasurable help in easing the problems of locating, accessing and retrieving relevant information, they present a host of new problems, especially in the conservative milieu of higher education. Thus, as the Report of the U.S national enquiry into scholarly communication (1979, p. 32) states so aptly, 'the scholar's essential work is still done with the mind, that will be just as difficult as ever – perhaps more difficult because there will be more possibilities and more information.'

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This poses an intriguing question indeed: do university researchers wholeheartedly accept the changes wrought in information activity by the novel technological developments for the blessing they are purported to be? That is, to what extent are they prepared to incorporate the various IT based information resources and services in their scholarly work? Trying to establish this from the published literature is the main aim of this paper.

Background and context: academic research in a changing information environment

The proposed focus on the academic researcher's acceptance of IT in their information activities needs to be seen within the wider context of their research work to be fully understood Thus, a good place to start from is with the nature of the research activity, by way of the three elements Noam (1997) identifies within it the creation of knowledge and standards; the preservation of information, and the communication of knowledge and information to others.

The creation of knowledge and standards

The creative element in research can be seen as a process, analogous to industrial or physical processes, such as the model described by Burnard (1990, p. 225), in which:

> information . . . is a product; collections of data or other observations are raw materials. Combined with the intuition and reasoning of the researcher raw materials are processed to form publications. These products in their turn ultimately become the raw material for another cycle of the research process. At each cycle . . . some additional increment of knowledge is extracted . . .

Thus, for example, Garvey (1979, p. 1) depicts the individual scientist's main effort as 'manufacturing' new information, either by describing new data or by formulating new concepts or conceptual integrations of data (theory). Burnard proposes a different approach. She finds that the model of research as a process, with quantifiable, identifiable inputs and outputs, does not reflect accurately the creation of new knowledge, assuming, as it does, both that all research areas are either productive or non-productive (whereas experience has shown that what is unproductive in one historical or social context may not be in another), and that all human knowledge advances incrementally (whereas sometimes we tend to see further 'by demolishing the giants who preceded us than by standing on their shoulders'). Instead, she suggests that we might more profitably regard research as a form of cultural activity aiming at the extraction of meanings and interpretations from the raw material of scholarship.

Whichever view of the creative component of the research activity is chosen, it is surely at the very heart of the scholarly endeavour, a pivotal factor in the researcher's success and the one where the direct impact of the all-electronic environment is probably the least felt.

Proceeding from Mortimer Adler's work on learning, Crawford and Gorman (1995) explore the relevance of computerisation to that essential part of the research activity, which takes place in the mind of the scholar. They conclude that among the 'four goods of the mind' on the Adlerian ladder of learning. information, knowledge, understanding and wisdom, where information has the least value and wisdom the greatest, information is the most amenable to computerisation. Since information, which can be further subdivided into data (facts and other raw material that can be processed into useful information) and information (data processed and rendered useful), is characterized by the fact that it does not require the human mind to provide it with meaning, it is eminently suitable for processing and transmission using electronic technology.

However, as we move higher up the ladder of learning, the human mind becomes vital and the role of the computer is consequently diminished Knowledge, defined as information transformed into meaning, can be recorded and transmitted, but the computer is not the ideal medium for such transmission. Understanding, defined as knowledge integrated with a worldview and a personal perspective, exists entirely within the human mind, as does wisdom understanding made whole and generative And, of course, being the purely mental processes that they are, they can and indeed are carried out without the direct support of electronic technology.

The preservation of information

The second major element of research activity according to Noam (1977) is the preservation of information. As Glicksman (1990, p. 342) points out:

> The scholar must describe the results of his work in a form which others can interpret faithfully. The scholar whose work is known only to herself is forgotten, in fact is never 'known'; the scholar whose work is not described well in a form which is available for future scholars makes it difficult for future generations to use her scholarly products. Hence scholars should and do take care to describe their work for peers to critique and use and for future generations to have as reference in their own work

In fact, Derek de Solla Price (1963) sees the establishment and maintenance of intellectual property as the motivating force behind scientific publishing He contends (p. 68) that the scientific paper seems to arise out of the researcher's need to lay claim to newly won knowledge as his own and as such 'only incidentally does it serve as a carrier of information, an announcement of new knowledge promulgated for the good of the world, a giving of free advantage to all one's competition.' Garvey (1979) too notes that the creative researcher's constant reporting on his work is impelled by strong motives to attain social recognition from his scientific peers for having made an original and relevant scientific contribution. True, both are talking about the scientist, who is under such intense pressure to publish 'fustest and mostest' because, as Price (1963, p. 68) puts it.

> if Michelangelo or Beethoven had not existed, their works would have been replaced by quite different contributions, [but] if Copernicus or Fermi had never existed, essentially the same contributions would have had to come from other people.

However, since achieving professional prestige has a crucial influence on academic tenure and promotion, as well as on the academic's standing among his peers, researchers from non-science disciplines are no less highly motivated to publish, if not 'fustest', then at least 'mostest'.

And, indeed, publish they do: Derek de Solla Price (1963, p. 63) cites Barnaby Rich, who wrote in 1613(!) that 'one of the diseases of this age is the multiplicity of books; they doth so overcharge the world that it is not able to digest the abundance of idle matter that is every day hatched and brought forth into the world.' What would Rich say now, some four hundred years later, when the profusion of published material has reached unforeseen heights? In the 1960s there were about 30,000 scientific journals published (Price, 1963). By the 1990s most branches of science show an exponential growth of about 4-8 per cent annually, with a doubling period of 10-15 years. There are at least 80,000 scientific and technical journals, and 1,500 scientific abstracting periodicals (Noam, 1997). In 1986 there were 378,313 research articles published worldwide in science and engineering alone, versus 267,354 in 1976 (Marchionini, 1995). *Chemical Abstracts*, for example, took 31 years (1907 to 1937) to reach its first one million abstracts. The second million took 18 years The most recent million took only 1.75 years. Thus, more articles on chemistry have been published between 1995 and 1997 than in humankind's entire history before 1900 (Noam, 1997) Plainly this has huge implications for the individual researcher.

If, as we have seen, the influence of novel information technology on the creative, intellectual element in research activity is at most indirect and marginal, its impact on the preservation element in it is much more strongly felt

The scholars of the past, though perhaps less daunted by the threat of 'publish or perish', still saw to it that the fruits of their scholarly efforts were suitably preserved and disseminated. In fact, Noam (1997) traces the preservation of scientific information as far back as ancient times, when the advent of writing solved the problem of transmitting information across time and space and led to the establishment of formal information storage institutions – libraries. The traditional practices of scientific information preservation, storage and retrieval, developed since then, are depicted by Glicksman (1990, p. 342) as follows:

> The scholars of the last century reported their work at conferences, and informed their peers of their work and its results through the publication of monographs and journal articles. The repositories for information were in individuals' collections of written and printed material, and in the libraries, museums and institutes of the world, both public and private in operation. But knowledge of what material was stored at a given location and even the identity of collectors of material were imperfectly known and difficult to determine for the scholar entering the profession. In fact, the scholar needed to have more than a detailed knowledge and understanding of his field of expertise. He also had to know what materials there were which were relevant to his work, and where this information was stored... Collections in specific locations (for example, libraries) led to concentration of subject, so that a given location would attempt to gather material having a theme in common. The libraries were cognizant of the need for them to study and keep a record of their holdings, and bibliographic information was developed by the library professionals so that scholars could know what was available in their libraries.

A century of far-reaching technological developments later, the information preservation and storage situation is much changed.

Information is no longer preserved and stored only in the traditional print on paper form, an increasing amount of material is now appearing first, or only in electronic form Digitalisation of older print material into machine-readable form is accentuating this trend (Oppenheim, 1997). The advantages of digitalisation for information storage and preservation are well-known even the most avid opponents of 'the madness of technolust' (so dubbed by Crawford and Gorman, 1995) admit that coping with the deluge of publications that characterizes the modern scholarly world would not have been possible without the information management capabilities of electronic technologies Nevertheless, Burnard (1990) and Kircz (1998) are both quick to point out that at the same time as providing indispensable tools to handle the flood of printed information, by enhancing the possibilities for information storage, retrieval and dissemination, innovative technologies have also facilitated the exacerbation of this flood into a torrent. Marchionini (1995, pp. 2-4) too, finds ambiguity in the role played by technology in the information age

> There is a tension between the goals and plans we make and the information resources necessary to achieve them; we travel a narrow road toward our goals with a sea of seductive information to distract us on one side and a spiralling abyss of confusion and information overload on the other. Technology accelerates the rate at which we are able to travel toward our goals, but it also increases the scope and peril of the two sides. Information in electronic digital form is both enabling and complicating On the one hand, digital information is more accessible – available from anywhere in the world with a few computer keystrokes or mouse clicks. On the other hand, it is less accessible because it is not directly perceivable to humans unaided by technology .. Electronic digital information is simple because it is fully expressed by only two elements (bits), but it is complex because many levels of coding schemes must be used to map the enormous variety of structure and meaning in the world into the binary form The many sets of codings necessary for humans to 'make sense' out of digital information allows the same digital code to be represented in many ways [and in consequence] standard coding

> schemes... facilitate communication and exchange of information, but the many possibilities support a kind of information alchemy in which words, numbers, images and sounds can be interchanged – for better or worse Given the sound and graphic editing tools available, it is no longer possible to believe that digitally recorded sounds or images represent reality The implications for humans are that additional levels of learning and cognitive effort are necessary to use, interpret, and validate information based on electronic digital expressions... [Furthermore], although much progress has been made in making computers easier to use, the evolution of hardware and software and the rapid pace of information creation and manipulation mean that for the foreseeable future, significant material and intellectual resources must be devoted to acquiring, learning to use, applying and maintaining electronic tools.

But perhaps the greatest danger inherent in the widespread use of information technology is the overriding importance attached to what is after all a set of tools, sophisticated as they may be, which, as Burnard (1990, p.230) puts it '. has led to a refocusing of attention on the medium at the expense of the message.'

In this context libraries, the traditional agents for the preservation, dissemination and use of knowledge, are facing probably the greatest challenges in their history Libraries are no longer the only storage-houses and providers of information, and librarians no longer aspire to be the gatekeepers, the sole possessors of the keys to information In fact, Lancaster and Sandore (1997), summarizing the current literature on the subject, warn that academic libraries are in a real danger of breaking down because they tend to be organized according to a model that is no longer relevant to the modern world of scholarship. As Noam (1997) observes, when information was scarce and hard to move, reproduction expensive and restricted and specialization low, scholars came to the information, therefore information had to be centrally stored and provided in a wide range of subjects Now, when the volume of information grows exponentially and the evolution of fields of expertise continues into ever-narrower slices, comprehensive library collections become increasingly unaffordable; at the same time, electronic alternatives are increasingly powerful in storage, broadranging in content and efficient in retrieval. In consequence, information flow has changed its direction: now it is more and more the information 'coming' to the scholar, and not vice versa. Sack (1986), thinking along the same lines, suggests we change our perspective. instead of viewing the universe in terms of libraries centrally located for users, we need to think in terms of each user being surrounded by libraries and other information accessing opportunities. Lancaster and Sandore (1997) too suggest that for the library to survive as an institution, it has to concentrate on building a virtual library infrastructure that can be organized and re-organized to meet changing research needs and to reflect new perspectives and interests. Moreover, now that 'the last librarian who knew every book' disappeared along with increasing information (Libutti, 1998), the part played by the academic librarian will also have to be redefined:

> The future role of librarians is likely to be a more active one, helping the scientist communicate properly as well as find needed information Since it is not likely that the typical scientist is going to become expert in librarianship, then the librarian must become expert in the communication structure of the world of science – a world which scientists have been amazingly successful in isolating from the outside world. (Garvey, 1979, p. 16).

The communication of knowledge and information to others

Having examined the impact of innovative technologies on the first two of Noam's (1997) research activity elements (the creation of knowledge and standards and the preservation of information), we now come to the third element – the communication of knowledge and information to others.

Noam (1997) draws our attention to the fact that the terms 'community', 'to commune', 'to communicate' are related linguistically as well as functionally to each other, and suggests that communities are defined by their ability to communicate. The academic community resembles any other community, inasmuch as it is defined by a set of common assumptions, a mode of discourse and a way of distinguishing itself from the rest of the universe (Burnard, 1990). But its members are strongly motivated to network themselves both professionally and technically with their peers in other universities and research organisations (Agre, 2000). The networks so formed are, of course, Derek de Solla Price's invisible colleges, which, although more central to the sciences and social sciences, exist in the humanities as well. The invisible colleges give their members status in the form of approbation from their peers, confer prestige, and, above all, effectively solve the problem of communication among scholars. They do this by reducing a large group to a small select one of the maximum size that can be handled by interpersonal relationships (Price, 1963). Garvey and Gottfredson's (1976) findings, in an extensive questionnaire survey of the scientific information-exchange activities of several thousand scientists and social scientists, conducted by Garvey et al. (Garvey, Lin, Nelson and Tomita, 1972a, 1972b and Garvey, Lin and Tomita, 1972a, 1972b), lend support to the notion of the scientific enterprise as a social system, whose salient feature is interactive communication and exchange of information and ideas among similarly interested colleagues. The social mechanism, which holds this scientific communication process together, is the interplay of the self-interest of individuals and groups, controlling one another Each scientist in any field depends on the opinion other scientists in his field have of him; he depends on other scientists to provide information to enable him to proceed with his work so that he can earn a good reputation. At the same time he is being depended upon by other scientists for his good opinion of them. If one scientist pursues his own self-interest too far in a direction incompatible with that of other scientists, he will be checked. Social groups obviously check individual scientists (e.g. the editors and their policy boards check and shape the individual scientist) and individuals can 'control' social groups (for example, editorial policies may quickly change if scientists important to a discipline divert their manuscripts to other journals) Garvey (1979, p.2) sums up the ensuing state of affairs saying·

> [thus] we have the situation where a relatively small group of scientists are reinforcing one another for successful contributions while at the same time competing with each other to be the first to proclaim such contributions to the group Each scientist has. . committed himself to a group with trust in its collective activity, while at the same time he is unwilling to place complete confidence in all individuals in the group in his quest to establish his own reputation.

Therefore, he adds, the scientists live in two worlds – a scientific world with its special norms and rigorous communication structure and a separate 'outside' world. Agre (2000) also notes the dichotomous nature of the scholar's world, albeit seeing it somewhat differently, saying that the research world has a matrix structure: on one axis are the campuses and on the other axis are the research communities Furthermore, he points out that scholarly interaction, both on the formal and informal level, is such an essential part of research activity, that the invisible colleges are in many ways more visible to the researchers than the physical campuses where they organize their places of work.

Unlike Burnard (1990), who feels that communication within the academic community has been affected by the development of more efficient means of information transfer in exactly the same way as has communication outside it, Agre (2000) discerns effects of the new technologies which are unique to academia. Moreover, while Burnard says that the undeniable improvements in scholarly communication, and hence, scholarly cooperation, are hardly so great as to approximate to a qualitative rather than a quantitative change, Agre argues that the impact of electronic developments on the flow of scientific information is far-fetching indeed He suggests that the advent of innovative communications media has brought about the invisible colleges becoming more and more real, with research 'centres' located on several different campuses and research communities developing their own network infrastructures, sometimes referred to as 'collaboratories', that encode their own distinctive methods, practices, and concepts. Noam (1997) also detects unique trends in the interaction among distant scientists, saying that electronic communications are now creating new electronic scholarly communities which respond to the elementary need for collaboration through computer based networks

It seems then, that while the profound changes in the information world of the researcher do not have much of a direct effect on the creative component of his work, the impact of these changes on the preservative and communicative aspects of his scholarly activity is significant So significant, in fact, as to lead to revolutionizing the ways in which research is conducted at the beginning of the 21st century However, before examining in more detail the world of electronic scholarship, we need to take a closer look first at the research process and the role of information in its advancement.

Information and the research activity

Research activity is inextricably intertwined with information· it is based on the use of existing information and aims, at least on an interim level, on the way towards attaining the ultimate goal of generating new knowledge, at the production of new information In fact, every scholar can be seen as a link in an information chain, on one side receiving scientific advances from his own and other fields of interest, on the other side processing the results of his own research into information for the benefit of others (Hills, 1983) Case (1986) cites Orr's model of the scientific knowledge generation circle (proposing that it can accommodate non-science fields too), in which the researcher is seen as a stream of inputs and outputs The inputs come from their observations of the world and from information generated by others, accessible either orally or in a recorded form; the output is the information produced by research, which goes to people (colleagues, students or project sponsors) and/or to records of some sort (books, articles, films, etc.). Thus, the researcher, aspiring to modify the existing state of knowledge by a new contribution, links together individual pieces of scholarly work, taken in their appropriate critical context This is accomplished by his citing prior work that forms the critical context of his own work while also linking it to the rest of the knowledge structure. Their work in turn is further argued, criticized, and referred to in subsequent publications, becoming part of the never-ending cycle of scientific advancement (Swanson, 1980). However, although the term 'research' is used indiscriminately in all the academic disciplines to describe the intellectual activity of searching for knowledge, ever since Snow (1993) coined the term 'The Two Cultures' in 1959, referring to the worlds of literature and science, there seems to be an ongoing debate concerning the nature of the humanities, as opposed to the nature of the sciences, which has further developed into a parallel debate on the nature of the social sciences in comparison with that of the sciences, on the one hand, and the humanities, on the other hand. The debate itself is beyond the scope of this work, as is the question of where precisely the boundary lies between the three disciplines, but the analyses of those generic features of research conducted in the sciences, the social sciences and the humanities, respectively, which may call for differential information provision, need to be explored.

Disciplinary-rooted differences in the conduct of research and their influence on information needs

According to Price's (1963) widely accepted observation, science progresses by a series of building blocks, whereby each generation builds upon the achievements of the previous one. However, Kuhn (1970) maintains that it is not invariably the case, and contends that scientific development is rather 'a succession of tradition-bound periods punctuated by non-cumulative breaks' Progress is achieved by a concentration at the frontier of research of ideas, data, experiments and findings, until consensus about theories and methods is obtained (Brittain, 1979) Research in the sciences is, therefore, painstaking experimental work, founded on previous findings and aiming at the accumulation of new discoveries (Line, 1973), and the scientist deals with realities, with phenomena amenable to mathematical investigation (Budd, 1989).

In comparison, the humanities do not normally progress in a linear fashion; one discovery is not necessarily the result of a prior one and will not necessarily lead to a later one (Budd, 1989). To use Meadows' (1974) picturesque metaphor, scientific knowledge grows in the orderly fashion of a skyscraper being built, with each new floor depending on the previously constructed floor for support, whereas growth in the humanities might more reasonably be compared with the construction of a rambling country house. In consequence, the humanist's research work consists less of sequentially inter-related blocks of knowledge and humanists' bodies of knowledge are rarely sequentially and hierarchically ordered (Weintraub, 1980). Since in the humanities knowledge grows by the discovery of facts and the methodical analysis of factual relations, in an effort to achieve understanding and discovering a meaning (Weil, 1973), the humanist, striving to reconstruct, describe, and interpret the activities and accomplishments of men and women by establishing and studying documents and artefacts created by those men and women (Wiberley and Jones, 1974), deals with the less tangible, the less concrete, relying more on informed opinion (Budd, 1989).

Brittain (1979) claims that neither does social sciences progress appear to be the same orderly process that can be seen in science of each generation's building upon the achievements of their predecessors; rather, each generation appears to react against the achievements of the previous one and to revert, at least in part, to earlier formulations. Nevertheless, seeing that in the social sciences knowledge grows by a gradual progress in understanding, based both on theoretical thinking and new data (Line, 1973), the social scientist's research looks, at least on the surface, similar to scientific research – problems are stated, hypotheses proposed, data gathered, and conclusions drawn. However, the social scientist's research work often does not follow the hypothetico-deductive research approach of the sciences: since many social science theories and problems cannot be resolved by and/or developed by the empirical inquiries alone, it is common for a theoretical point of view in the social sciences to be supported by citing other reports of theory building or empirical evidence (Brittain, 1979) At the same time, since the social sciences, like the humanities, attempt to describe and explain the activities and accomplishments of men and women, the social science researcher's work seems to resemble that of the humanities researcher But with a difference: humanists use sources created by the subjects of their research, while social scientists initiate and, much more than humanists, participate in the creation of their sources (Wiberley and Jones, 1994).

These discipline-rooted differences in research patterns entail corresponding idiosyncrasies in information needs of researchers, as shown in the seminal works of Line (1969, 1973) and Britain (1979) on the subject

Since the advancement of science depends on the accumulation of data, and every scientist stands on the shoulders of hundreds (or thousands) of other scientists, access to the data that have been accumulated is of obvious importance. However, where the findings of previous generations of scientists are still relevant, they are part of the building blocks of science, and therefore readily available in textbooks, treatises, handbooks, etc Many other scientific works are superseded and become obsolete – only historians and philosophers of science require an active information service for data and information that is much more than about twenty-five years old. Citation practices in the sciences supply abundant proof to this point the oldest person on a list of the 300 science authors most cited between 1961 and 1976 was born in 1899 (Garfield, 1980).

If scientists do not seem to require access to more than a generation-old literature, they are very anxious indeed to ensure that they are well aware of current and recent information Not so much out of choice maybe. In fact, as Meadows (1974) points out, scientists usually prefer to avoid the tedious task of acquiring information, being more interested in the research process itself than in the results of other people's work But because the penalties for not keeping up are heavy· first of all, no scientist would want to publish work which betrays ignorance of relevant discoveries and facts, and, in addition, repeating some research to obtain information may slow progress unnecessarily, thereby impeding the establishment of the priority of a discovery (Garvey, 1979) Thus, on the basis of his findings in his study of scientists' sources of information, Voigt (1959) identifies three distinct information needs of the science researcher. The first is the need to know what other scientists have recently done, or are doing, both in the specific field in which the scientist is doing research but also in a broader area (the current approach). The second need for information is the one that comes to the scientist in the course of his work – a need for some specific piece of information directly connected with the problems at hand (the everyday approach) The third need for information is the need to find and go through all information existing on a given subject. Usually the specific subject the researcher is working on (the exhaustive approach), which arises when the researcher starts work on a new investigation and becomes even more urgent at the time he reports on the results of the investigation. Menzel (1964) adds a fourth need for information: the researcher's need to brush up on a field, to familiarize himself with a field of inquiry which had not previously been included in his attention area, either because he wishes to branch out to a new line or because he wishes to understand developments in some line that is new to him, in the hope of adapting them to work in his own old line.

At the other extreme, the humanities are mainly dependent either on fairly well-established data (such as historical archives) or texts (literary or other), or on original thought and interpretation – or both. Consequently, as Weintraub (1980, p 25) observes

> humanists are probably the most book-bound creatures in the world of scholarship . .Their appetite for books is insatiable... Many humanists have a special reverence for manuscripts. . Humanists care about texts in their varieties. They usually need all editions of a text, not just the printed texts but preferably also all the first drafts, second drafts, galley proofs, and page proofs to study the process, for example, whereby Balzac gave final shape to his 'Comedie humaine' . They need texts in their original languages – which does not prevent them from wanting the translations as well Much of humanistic scholarship has a strong historical dimension. The old book (not the rare book) is thus at least as important as the current book

In other words, humanists need first and foremost primary sources of information, which they interpret using their judgement and imagination (Wiberley and Jones, 1994)

Thus, since the humanist researcher's innovative contribution to knowledge can consist of different perspectives or different understandings of the same work and might not present any new 'facts', awareness that others have worked or are working in the same field is less important. There is small chance of actual duplication occurring, and it may not matter much if it does, so long as each presents an original interpretation – for example, two biographies of the same historical figure appearing at the same time may complement each other usefully. Consequently, as Stone (1982), drawing on the work of Reagor and Brown suggests, having retrospective coverage of the literature may be more important to the humanist than having access to current material. Since the humanist researcher desires to understand either a work of man or the lives of specific men, or the minds standing behind the works of men through texts (Weintraub, 1980), works published decades ago might still be definitive works for them The humanist scholar cannot rely on recent material alone, as it may or may not incorporate or build on a previous body of knowledge, and even if it does, past work may be required for purposes of comparison. Recent documents may present the most up-to-date perception of a particular set of events in the light of both past and recent evidence, but scholars may still wish to go back to the original sources, rather than rely on the characterization of those sources built into any interpretive work about them (Stone, 1982). Also, as Garfield (1980) points out, interest in a work or period may remain dormant until it is reawakened in some way, so that previously unheeded material may assume or resume importance. It is, therefore, hardly surprising to find differences in the works consulted by scientists and humanists· if, as mentioned above, among the 300 most cited science authors between 1961 and 1976 the oldest person was born in 1899, in a humanities citation study 15 of the 300 most cited authors between 1977 and 1978 lived before A.D. 1400 and nearly 60 per cent were born before 1900 (Garfield, 1980).

As to the social sciences – obviously, if research in the social sciences differs from research either in science or in the humanities, there is every reason to assume that information needs in the social sciences would have distinctive features as well Line suggests that information needs in the social sciences fall somewhere between the humanities and the sciences, as a result of the social sciences' depending on, and drawing from, both the sciences and the humanities to an extent that these two broad areas do not draw from the social sciences. Thus, some social scientists resemble humanists, inasmuch as they are concerned mainly with theory and concepts, often from a multi- or inter-disciplinary approach and as their main source of information is their own thinking. Others are more like scientists in basing their research on data, frequently using information that is current and readily available (for example, election statistics) or generating their own information, in the form of survey data or economic models. However, unlike scientists, they also rely heavily on past research findings and evidence accumulated in regard to a particular theory, especially when theories cannot be supported by experimentation and scientific verification. In any case, the data they use is rarely of so 'hard' a nature as in the sciences (that is, it is less of a high factual, particularly mathematical, content), because of the inherent instability characterizing the subject matter of the social sciences – human beings and their interactions with one another.

According to Line, the social scientist, just like his humanist colleague, is less concerned with currency than the scientist. the dangers of precise duplication of an experiment are very small, since the circumstances differ from place to place and from time to time, and the penalties for not knowing other works are correspondingly less severe. However, it is unclear whether Garvey and Gottfredson (1975), on the basis of Garvey et al.'s series of longitudinal studies of the information-flow and dissemination systems of several disciplines in the sciences and social sciences (Garvey, Lin, Nelson and Tomita, 1972a, 1972b and Garvey, Lin and Tomita, 1972a, 1972b), share Line's view that the social scientists feel less compelled to follow closely the developments in their fields than their scientist colleagues. For one, although the investigators are quick to point out any disciplinary associated differences among researchers, they do not distinguish between scientists and social scientists when they observe that for a researcher lack of awareness to the existing information in his field makes progress slower than its potential, and endangers his priority in making the contribution Moreover, it is possible to infer from the findings presented in another paper based on the above-cited study (Garvey, Lin and Nelson, 1970) that social scientists are no less anxious to keep informed and to ensure priority in making a scientific contribution than their scientist colleagues Apparently, each stage in the process of the production of scientific articles – from the inception of a work to its publication – occurs closer to the time of publication for the physical sciences than for the social sciences, and as a result the social scientists start disseminating prepublication reports of their articles earlier (28 months before journal publication) than the physical scientists (16 months before publication) and continue prepublication reporting over a longer period (13 months, as compared to 7 months for the physical scientists). These differences between the physical and the social sciences, associated with the methods they devise in order to overcome lags in the process of information flow, seem to indicate that social scientists take great pains indeed to compensate for any impediments to their ability to obtain and disseminate up-to-date information.

Having surveyed the characteristic information needs arising in the course of the scholarly endeavours of researchers from the perspective of each of the three major disciplines, we now come to the question of how they go about fulfilling these needs

Fulfilling research information needs – inter- and intra-individual variations in researchers' information seeking behaviour

Garvey, Tomita and Woolf (1974), in their analysis of the findings of the above mentioned survey, conducted by Garvey et al (Garvey, Lin, Nelson and Tomita, 1972a, 1972b and Garvey, Lin and Tomita, 1972a, 1972b), focus on the 'typical' research process in the sciences and the social sciences. Exploring the function of information use at its different stages, as well as shedding light on the 'intra-individual variations' in information use (changes that occur within individual scientists as their scientific work progresses)

According to their findings, there is a reliable progressive order in the stages of scientific research (though not always consciously or rigorously followed by the experienced researcher):

a) preliminary planning (general);
b) specific planning: theoretical/conceptual;
c) preparation of written research proposal;
d) preliminary experimentation/field trial or mockups;
e) calibration, pre-testing, etc;
f) design and development of equipment/apparatus;
g) formulation of experimentation/study design,
h) collection of data;
i) analysis of data;
j) interpretation of results;
k) preparation of report of work.

At any given stage of their research the typical scientist is likely to be involved in more than one of the above stages of scientific activity, but these stages are typically clustered in a direction which progresses toward completion and publication. As it has already been noted, the scientist is constantly on the lookout for information that will place his work in context with other work underway or recently completed, in order to ensure that he remains at the cutting edge of science, but he also needs information beyond his own knowledge in the progress from stage to stage in his scientific work Since different kinds of mental processing are going on at the different stages of scientific work, different kinds of information are required at the different stages: during the early stages, information serves as an aid in the perception of the research problem and in the formulation of procedures appropriate to the inquiry; in the intermediate stages the researcher's need of information becomes more specific (for example, he wants details of techniques and methods), in the final stages his information needs shift to the general body of scientific knowledge, as he seeks to fully interpret his data and integrate his findings into the current state of scientific knowledge. Therefore, the typical scientist uses a variety of sources, both formal and informal, at the different stages of his research. In addition, since the productive scientist is generally engaged in more than one piece of scientific research at any one time, at any instance he may have different information needs relative to several different research activities. Moreover, some sources are better suited for providing certain kinds of information: for example, journals were found to be most useful in providing information needed to place a scientist's work in proper context with similar work already completed and to integrate his findings into current scientific knowledge These two were the kinds of information least frequently obtained through informal channels, such as colleagues or students, while local colleagues and students were superior providers of more technical information, such as data collection techniques. In light of these findings, Garvey et al (1974) suggest that information providers be conversant with the scholarly research process, so that they can enquire as to the stage of research for which information is being sought in order to be able to meet information needs more efficiently.

However, Kircz (1998), who also discerns different information consumption needs at the different stages of a research programme, argues that an additional measure is necessary in order to ensure that the researcher finds information necessary for his work more quickly and better placed in context He divides the scientific readers into four general categories (out of which only the first three are of concern here, the fourth category being that of the science administrator), emphasizing that in the course of a research programme a reader changes from one typology to another and back again. The first category is the informed reader, who knows what he is looking for and is able to find their way around the literature quickly; this knowing-where to-look-reading is typical for the stages of research where precise, pertinent information is needed. The second category is the partially informed reader, who is not conversant with the specific research as such, but is interested in the general aspects that might be of use for their own investigations. This type of reader wants to know how a particular paper fits within the broad spectrum of their own research, what the relations are with other methods in the same field, and what the connections are with related fields, typically in those phases of the research process where ideas and results are to be confronted by and compared to other related work.The third category is the uninformed reader, the researcher who wants to learn something new in the exploratory phase of a research project, who hopes to get a fresh idea from fields that are either unknown to him or of which he has only a rudimentary knowledge. Kircz proposes, that the electronic-era scientific paper provide information tailored to the requirements of each type of reader, suggesting that this can be accomplished by breaking up the present-day linear type classical article into a coherent set of well-defined modules, each with its own characteristics, so that the reader can access (by 'zooming-in/out') only the module they need, when they need it.

In the absence of empirical studies of a similar nature into information use at different stages of the 'typical' research process in the humanities, Watson-Boone (1994) attempts to 'open a window into the mind of the individual humanities scholar' by piecing together a tentative outline of the different stages of the humanistic research process on the basis of a personal account of a historian, Stephen Nissenbaum, from his description of his work on the creation of a poem:

Stage I· Ideas, Speculation, and Interweaving
During this period, Nissenbaum moves from ideas to speculations, which yields direction or focus

1. makes a mental note to hunt down a early illustrated edition of the poem,
2 'thinks', 'skims' a variety of material, 'learns', 'infers', 'wonders', 'begins to connect';
3. a colleague makes a suggestion,
4. Nissenbaum 'continues to speculate', and four critical suggestions evolve;
5. develops an intriguing angle.

Stage II. Focus, Findings and Completion
During this period he seeks evidence, makes findings and revisions, and comes to some initial conclusions:

1. he has a month of relatively straightforward pursuit, based on now-formed categories of information;
2. he derives some findings;
3 he develops five hypotheses;
4 evidence, some more findings, initial conclusions, and three new hypotheses emerge.

Taking this outline of a research process for what it is – a chronological construction of what appears to have been one scholar's research into a specific problem (although Nissenbaum says that this is really the way he mostly works), it nevertheless rings true. In fact, Stone (1982), in her review of the literature on the information needs of humanities scholars, draws a similar picture of the research process in the humanities, summarized by Case (1986) into the following outline:

- thinking and talking to people about the topic;
- reading the studies that have already been done in the area;
- studying original sources and making notes on them;
- drafting an original contribution to the literature; and
- revising the article for publication.

Evidently, humanistic research proceeds along the same general lines as scientific research, progressing from planning, through collection and analysis of data and information, to the interpretation of the results. However, there is one noteworthy difference between the two: the subjective component permeates the different stages of the humanities researcher's work to a greater extent. As Reagor and Brown (1978, pp. 242-243) put it: '. humanistic knowledge results from the application of one mind to investigating a slice of reality and interpreting it anew in the context of that individual's total experience and understanding.' Weintraub (1980, pp 30-31) expresses the same notion in saying that:

> the scientist can have the belief – whether right or wrong – that he queries an objective nature until his mathematical relations correctly express its fundamental workings. The humanist's object of study is a much more multi-layered one, and their conceptual tools are much more problematic in their adequacy to the supposed reality... The subjective elements of all the knowers, makers, and players with cultural forms, as well as his own subjective aspects as knower, are forever entwined with his knowledg... the humanist relies on heuristic devices, tools of discovery, such as 'ideal type' constructions, systematic conceptualizations, mental constructs that in his world may embody something like normative assumptions and notions concerning man's behavior, the categories of his mind, the character of his creations, like genres, for instance These rarely have the sharp crispness and the logical clarity of scientific theories, but they may play a similar role . He must determine the relevance and suitability, the reliability of his data. He cannot experiment on his data, but he may be able to run thought-experiments, think through the 'if-propositions', and try to separate out, in a painfully tenuous sort of labor, the adequate cause of events. Rarely can he settle a matter with the decisiveness of the scientist's answer

It is, incidentally, this highly individualistic and subjective manner of conducting research which explains the humanists' well known fondness for browsing: examining the catalogue, scanning titles of books in the stacks or leafing through a book which sometimes results in his stumbling across information which may bring about the fortuitous discovery of connections between ideas and words (Saule, 1992).

As a result of the subjective nature of the humanities research, humanists prefer to work alone, the collaborative efforts among humanists are less customary than in the sciences, and the notion of the invisible college is less observable (Stone, 1982). Weintraub (1980), too, notes the scientists' collaborative vs. the humanists' more individualistic style of research work and speculates on its origins scientists, he says, have a much clearer sense of where the frontier of knowledge currently lies and what the truly significant issues at the frontier are. For the humanist the whole tradition is often essential and present, the frontier is less visible, and the dominant current concerns need not be as significant as they are fashionable The scientist's knowledge of the relevant problems on the frontier permits him more frequently than the humanist to collaborate usefully in advancing and ever more systematizing knowledge of an objective world of nature, whereas the humanist tends to be more alone with his problem. Wiberley and Jones (1994) also seek to provide insight into the humanist researcher's obvious reluctance to collaborate in research, contrasting his work-style to that of the social sciences researcher: humanists do consult colleagues, but tend not to share responsibility for projects, since their primary evidence, unlike the social scientists' primary evidence, is neither easily categorized and entered into a relational database nor readily subjected to quantitative measure or statistical analysis; as such, the humanities research project cannot easily be divided into discrete tasks that different members of the research team can perform separately and later assemble.

Interim conclusions

It seems then, that although scholarly research proceeds within a clearly discernible generic framework, the academic culture surrounding the disciplinary areas brings about characteristic differences in thought processes and work-habits, which have been shown to entail discretionary information needs and uses both on the inter-individual and the intra-individual level. With the advent of the brave new world of electronic scholarship, these traditional patterns of information activity are tested against a promising, if perplexing array of evolving opportunities for new methods of fulfilling information needs. Thus, looking at scholarly information seeking behaviour in the past few decades is in fact telling the tale of the transition to the electronic information era in academia.

The second part of this article will appear in the next issue of Aslib Proceedings.

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